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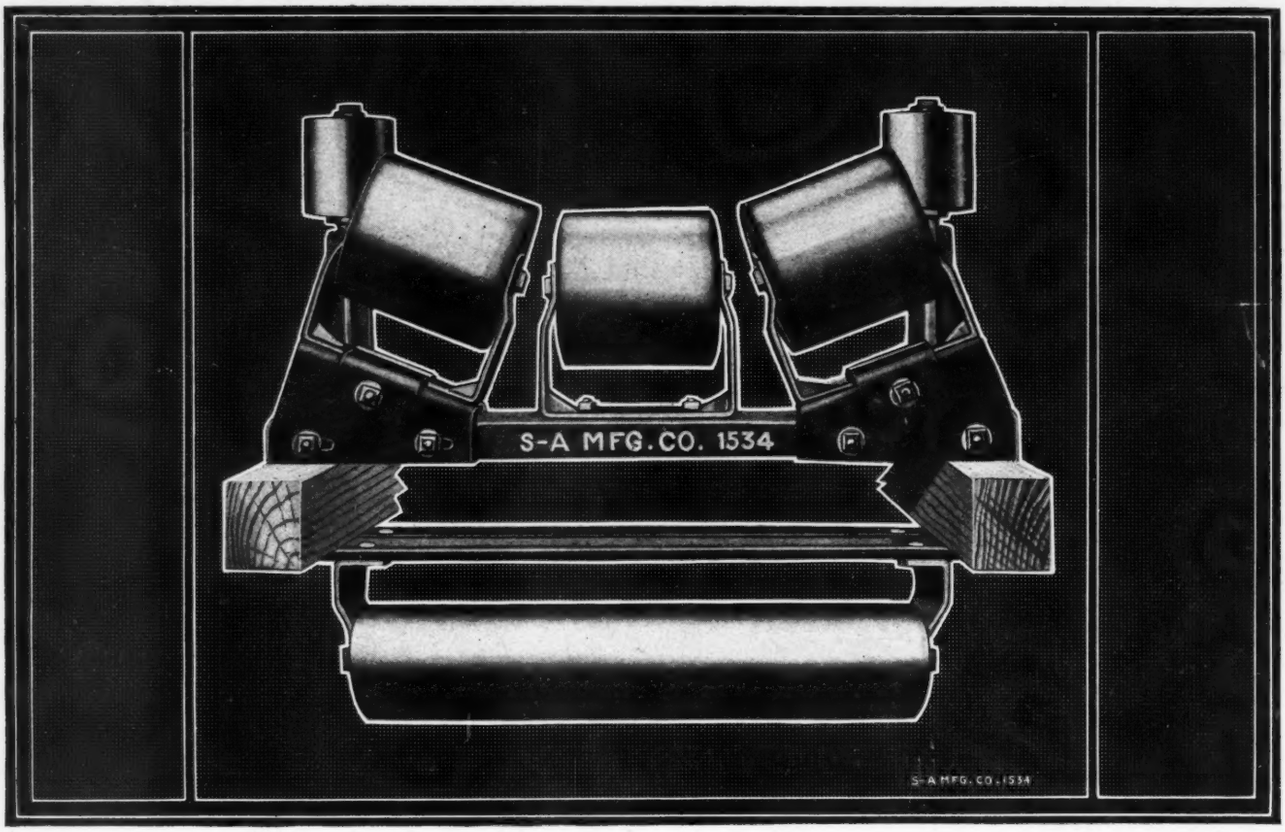

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Engineering and Mining Journal

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Volume 108 | New York and San Francisco, October 18, 1919 | Number 16

The Steel Strike—and Others

THE strike in the steel industry shows no signs of terminating; but at Gary, the nerve center of the situation, the theoretical passivity of the striker has threatened to turn into violence, and destruction has been held back only by Federal troops, machine guns, and artillery. The contest is a gigantic one, involving the most essential single industry of the country or the world—the United States iron and steel industry. It is not directed against any particular organization, the great corporations like the United States Steel Corporation and the Bethlehem Company standing on no better or worse a footing than smaller producers. It is a strategic campaign on the part of certain obscurely known organizations to control the steel industry.

That is the issue, plainly enough stated on both sides—the open shop: whether the employer shall employ whom he finds capable and desirable, and the employee shall work when he so elects and wherever he finds the best opportunity and conditions, or whether both capitulate to a subterranean and external control; whether a great technical and scientific industry shall be controlled by its stockholders, its engineers, its experts, its organizers and its skilled and unskilled workmen in a due and agreed proportion, or whether all shall become absolutely subject to orders issued from nowhere in particular and emanating from nobody knows whom.

It is clear that in many cases at least, the employees had no wish to strike and had nothing to gain thereby, but were coerced into so doing. It is equally clear that the willing forces of the strikers are mainly illiterate aliens, as stated by both sides at the Senate inquiry; and we have the testimony of the Mayor of Gary and General Leonard Wood that the dangerous element lies in anarchistic propaganda.

Signs are not wanting here as elsewhere that the American Federation of Labor is not heartily sympathetic with this particular campaign of domination, and that it is only withheld from active participation in the opposition by the fear of being classed as on the side of the "capitalist" and losing control of the labor situation.

Lesser strikes are in progress all over the country. The strike has become the holiday of the workman, his assertion of freedom, his magical Aladdin's lamp to rub and command. Originally a means to escape from distressing conditions, it is by no means always so at present; indeed, the opposite is sometimes the case—the striker goes out because he is making so much money that he can afford to "lay off," and the sky is the limit of the game of poker he plays.

What of the ethics of this popular game? Undoubtedly, in most cases, a man has the right to quit work, as the labor leaders point out. This right is naturally paired off against the right of the employer to hire whom he pleases, which employers point out. Certain reservations, however, must be made to both these rights. The rights of an individual terminate when his freedom of action injures another individual or limits his liberty. There is the actual case of the newly arrived alien who killed his wife and was shocked and surprised at being arrested; he had understood that he had come to a free country. A watchman at a bank has not the right to quit work without notice—he can quit only when he has personally seen to it that his work is being carried on; nor can the keeper of the lighthouse, the hoistman at the mine, nor many others. And the fundamental right of the employer to employ and to discharge has similar well-understood limitations.

Granted, in general, the individual right of the workmen to quit, however, what of the organized quitting called the strike? Quitting then becomes not an assertion of individual freedom but a force in strategic conflict; even if done quietly it is not passive but an active economic blockade of capital's ports, to obtain terms which theoretically cannot be obtained by peaceful negotiations. When employed as a counter-move against a similar economic blockade put down by the employers, singly or organized, it is the natural rejoinder of labor; it is indisputable that measures more active than talk have to be taken in the affairs of the world every now and then. When such a conflict begins to injure the public in general or an appreciable part of it outside the conflicting parties, one or both are overstepping their rights; and therefore widely organized labor and capital alike must be careful in their moves.

As an absolute rule, then, the right to strike cannot be granted. Could the American army have struck for $50 per month and no trench work on the morning of Chateau Thierry? Lest you think this far-fetched, let it be added that we know a college graduate who claims that the army has the right to strike. Have the Federal troops at Gary the right to take the opportunity to strike? The policemen of Gary? The policemen of Boston? of New York? Have the postmen of the nation the right to strike? The telegraphers? The railroad men? The steel workers? The coal miners? Have

the doctors of the nation the right to organize and strike for double pay, cash or no service, time and a half for overtime and no night work? Have the Government clerks at Washington that right? The keepers of lighthouses? The judges?

Why not? Many of these things have happened; and the rest may happen. The Washington Government clerks and scientists are organized as a branch of the American Federation of Labor; the actors' strike shows the possibility of the professions; and the extreme advocates of labor organization are jubilantly looking forward to the time when all men receiving wages or salaries shall have been organized into one grand union.

The spectacle results of classes representing small minorities pressing alternately their advantage against all other classes by a system of force, passive or active, not consistent with the principles of equal justice toward all and the great balanced theory of the greatest good to the greatest number as the best possible condition. It is the system of the gentleman who boards a train at the opportune moment, and with the strategic advantage of being at the right end of a six-shooter, relieves the unwilling passengers of their cash. Organized capital is equipped also for just such undemocratic moves.

The ultimate objects of the steel strikers may be divined to be akin to the ingenuous Plumb plan for the railroads, whereby these arteries of the country are to be turned over to the engineers, firemen and conductors for the exploitation of the public. Soon, if the movement proceeds happily, we shall have the steel workers controlling the mines, furnaces and mills, the coal miners the fuel supply, the bank clerks the banking system, the counter-jumpers, floorwalkers and drivers of delivery wagons the department and chain stores, while to the policemen will fall the tribute or plunder of the cities.

This is sober truth, and not jest. The bituminous coal miners of the country are due to strike on Nov. 1, at the beginning of winter, to enforce by the freezing out of an unprepared people their plan for the nationalizing of the coal industry. The idea of the will of the majority and the test of the ballot is obsolete or not yet heard of by these ignorant and violent aliens.

What will be the result of all this state of destructive economic civil war which is upon us? As Hoover has pointed out, Bolshevism has succeeded in Europe in proportion to the illiteracy. In illiterate and ignorant Russia it has endured many months. In relatively well-educated Hungary it did not last many weeks. How long will America, foremost in education and intelligence of all nations, stand for the undemocratic domination by force of alien minorities; of cliques and conspiracies formed by the scum of the most backward European countries? In view of the principle above stated, the answer is reassuring.

Everywhere the strike situation has got beyond the control of organized American labor, as witness the open stand which the American Federation has found itself compelled to take against the printers' and longshoremen's strikes in New York, and others. On Oct. 13, out of seventy recorded existing major strikes, only eight had the sanction of American Federation. The present crisis threatens organized labor as direfully as any other group.

When, then, are strikes justifiable and permissible, and when do they cease to be so? When the economic blockade or embargo which is thereby laid down is directed against the public or it is the public which primarily suffers under it, rather than the antagonized employers; when the strike organizers count on victory through the surrender, through starvation, cold, danger, hardship, or discomfort, of multitudes of men, women and children not parties to the specific differences between employer and employee which led to the strike, and through the inability of employers to withstand the pressure of such a defenseless multitude calling on the only responsible party to the strike to make peace at any price to them, then a strike becomes a conspiracy against the people, an act of civil war carried on by one of the best recognized and most efficient methods of modern warfare, and should be dealt with promptly by those civil and military organizations which the people has provided for its own protection, that it might go about unarmed and unafraid of foreign or domestic aggression.

We suggest the appointment of a Federal Strike Commission, composed of representatives of the Public, Labor and Capital, such a commission to license a strike of more than a certain number of employees before it would be legal; and strikes without the nation's approval to be punishable by the Federal authorities.

Institute Mine Taxation Committee in Washington

THE meeting of the specially appointed mine taxation committee of the American Institute of Mining and Metallurgical Engineers, at Washington on Oct. 6 and 7, in co-operation with the Bureau of Internal Revenue, was a most notable and significant event. The subject is not a minor one but of the greatest importance to the industry and to the nation, as mining is its second largest industry. Therefore the men summoned by President Winchell came from many States and formed an impressive gathering of what is best in mining engineering.

Delegations to Washington, representing special interests and seeking to obtain just recognition, or more, for the industries or groups they represent, are extremely common; but this visit did not partake of that character. Coming at the special request of the Internal Revenue Bureau, and representing the mining engineering profession, and not any special interests, there was no hint of any attempt or desire to "put something over," or to obtain any more favorable interpretation or application of the law than that desired in all fairness by those Government officials charged with its administration; nor were there clashes of interests intent on securing representation. Instead of "the discordant grinding of many axes," there was the quiet and impressiveness of a common practical and elevated purpose.

The engineers presented themselves as expert advisers, familiar with the facts and the equities of the income-tax and excess-profit laws as applied to the mining industry, and seeking intelligently the means for securing to the Government the payment of the necessarily heavy tax, without killing or even breaking the legs of the goose which lays the egg of gold, copper or steel. An unintelligent and arbitrary interpretation or administration of the situation would have exactly this suicidal or destructive effect, and the future of the mining industry, in so many branches of which the United States dominates the world, depends to a considerable extent upon the handling of this delicate situation.

The recommendations of the committee are not yet maturely formulated, although entirely satisfactory progress has been made, and the final presentation will probably be possible in a few weeks.

The first adventure of the Institute into public affairs under its new charter should be followed by others, wherever good may be accomplished. The precedent is an excellent one.

The Importance of Telling The Whole Story

IN GIVING treatment and operating costs, technical writers should be extremely careful to explain as completely as possible not only the prices and conditions obtaining at the time the given costs were entailed, but also exactly what the stated figures embrace. For example, some one might state the cost of reverberatory smelting to be $2 a ton at a Tennessee smeltery, and the careful foreman in British Columbia might think that he was behind the times when his monthly reports averaged $3.25. Yet if he thoroughly understood how each figure was determined he would possibly decide that a trip north would be of economic benefit to the Tennessee managers. He might find that labor and fuel were much cheaper at the other plant and that his own figure included interest and depreciation and half the superintendent's salary! (There being no reverberatory smelting in Tennessee, our readers must not enter these figures in their notebooks.)

Cost comparisons are even more odious than other kinds. They rarely mean anything without a complete study of the work covered. The more embracing they are, the less they can be understood. In the case mentioned it would be almost impossible completely to explain the $2 figure, but a statement that the repair cost of a disk crusher was 5c. per ton of ore crushed would be fairly intelligible if accompanied by a description of the ore, size of feed and product, tonnage per day, size of crusher, facilities for repair work, cost of new steel and babbitt, character of the necessary repairs, price of labor, and a few minor enlightening details, such as the Bolshevistic tendencies of the repair crew.

Possibly the foregoing remarks may give a clue to the reason why some companies do not care to make public their costs. They may also explain, on the other hand, why other companies offer them freely to the metallurgical world.

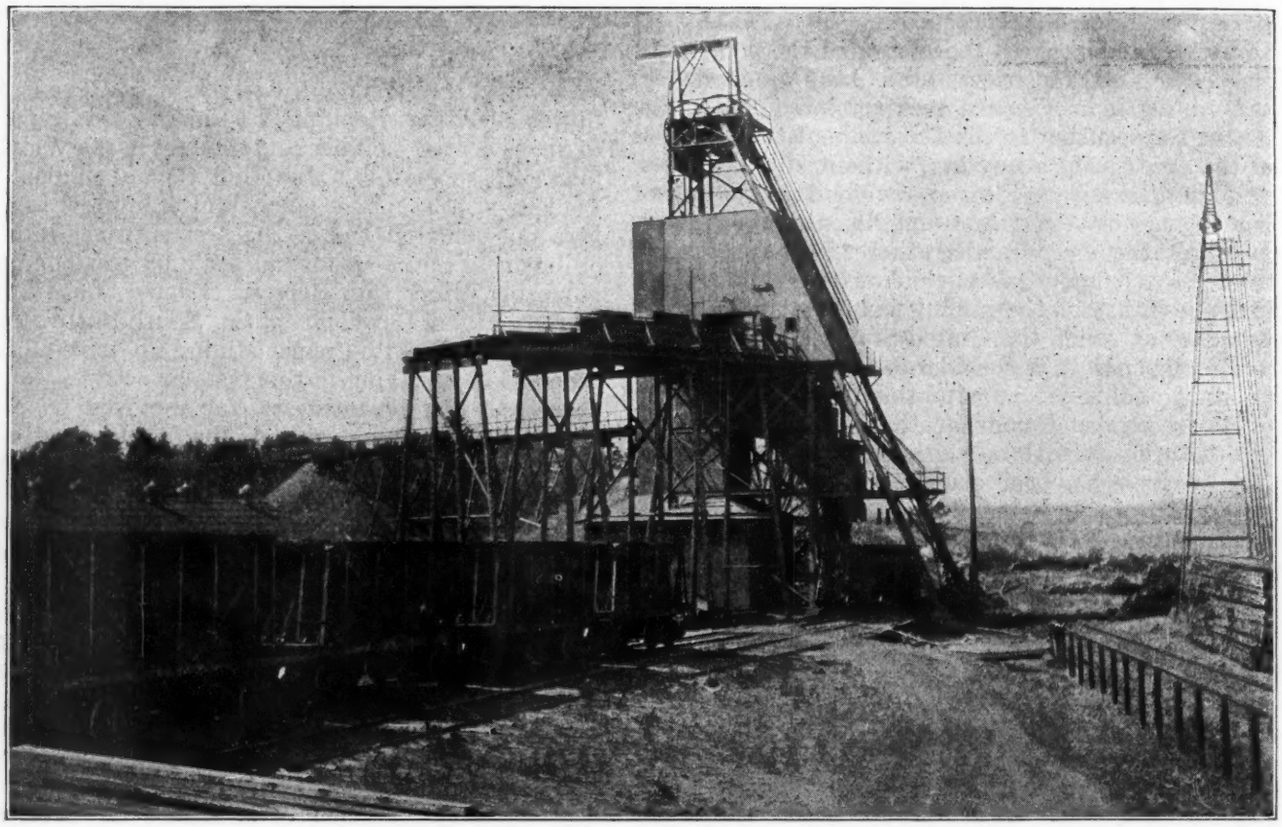
The Natural Trend

ANOTHER prominent mining company has joined the ranks of the oil producers. The United States Smelting, Refining & Mining Co. is reported to have secured a 50-per cent interest in the Wrightsman oil properties in the Bull Bayou oil field, in Louisiana. Except for a substantial interest in Ventura Consolidated, this is the first entrance into the oil business on an important scale by this company. Nipissing Mines Co., Helvetia Copper Co., Southwestern Miami Development Co., South Butte Mining Co. and East Butte Copper Mining Co. have all been reported as engaging in this popular activity. Many other and diverse interests, far removed from the environment which surrounds the development of oil lands, have made their advent in the field. Prominent among them have been railroads and the Cities Service Co. belonging to the Doherty interests, which organization has achieved a noteworthy success.

The transition from the development of mining claims to that of oil lands is a natural and logical one. The problems are quite similar. The science of geology has always been associated in the popular mind with mining, and so have the mechanical skill, and the hazard of prospecting, which constitute the two requisites in the bringing in of an oil well. The development of oil lands, however, is a comparatively simple operation and requires the solution of none of the intricate engineering problems involved in mining. Wealth flows to the surface in the form of oil much more easily than it is won from copper metal deep in the earth; and with the passing of the peak of opportunity for metal mining in the United States, the natural trend is for metal mining companies to invest a part of their accumulated surplus in the mineral industry of the hour.

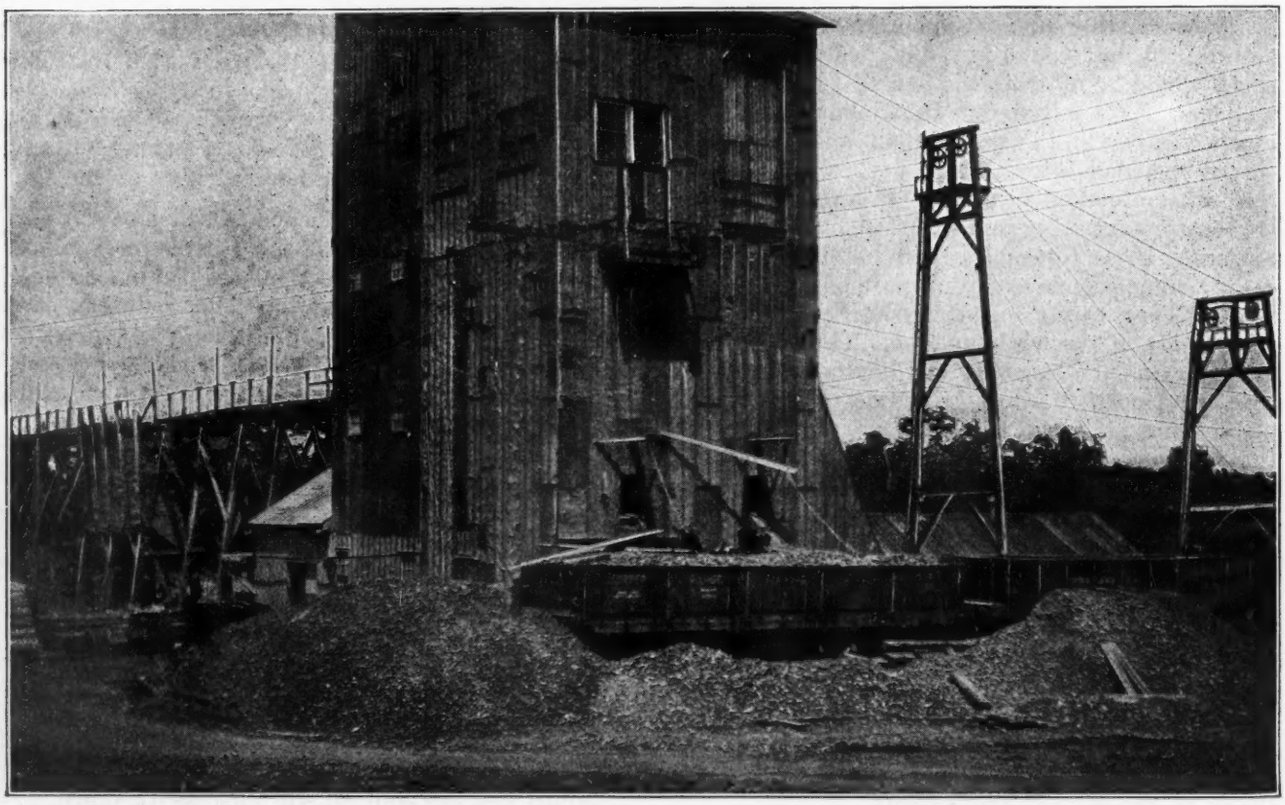
A New Department The Petroleum Section

The Journal has published in times past a number of articles dealing with the petroleum industry as well as with the subject of petroleum engineering. So important, however, has the industry become that we are starting in this issue a new department —The Petroleum Section. In this we will publish short articles on practical details, statistical material from various sources and information useful to engineers and others interested. Subjects of broader scope will be published as before among the leading articles of the various issues of the Journal. The establishment of the new department is another direction in which the Journal will increase its field of usefulness to its readers. It is hoped that engineers will not only contribute to this section but will also lend their aid to us in bringing the many important developments which are taking place in the comparatively new field of petroleum engineering to mining engineers, as well as to the industry. We feel that there has not been sufficient attention paid it but the Journal will now do its share.



MEACHAM MINE OF ROGERS BROWN ORE CO. AT CROSBY, MINN.

Photographs From the Field



SHAFT OF SENECA MINING CO. NEAR MOHAWK, MICH.

Ore Deposits of Utah*—Part II

Evidences Show the Formations of the Large Orebodies of Utah Were Influenced by a Relation Existing Between the Enterior and the Surface at the Period of Solidification—Brecciation of Rocks Favorable to Ore Deposition

By B. S. Butler
U. S. Geological Survey, Washington, D. C.

IT HAS been pointed out that the exposed intrusive bodies in the eastern part of Utah are characteristically laccoliths, and that those in the western part are stocks. The present erosion surface has truncated the stocks at different distances below their tops, and, in fact, there is reason to believe that some stocks have not yet been exposed. Stocks that are truncated near their apices are designated apically truncated stocks; those that have been more deeply eroded are termed medially truncated stocks.

FRONT OF WASATCH RANGE AT THE MOUTH OF LITTLE COTTONWOOD CANYON

In studying the relation of ore deposits to the different types of intrusive bodies it was a matter of some surprise to find that more than 99 per cent of the metal production of the state derived from deposits associated with igneous rocks had been from those associated with apically truncated stocks. Prospecting of deposits associated with laccoliths and medially truncated stocks, though it has been carried on intermittently for more than forty years, has not developed a single mine of first- or second-class importance.

The scarcity and small size of ore deposits in association with the laccoliths of Utah is thought to be related to the slight degree of differentiation that is observed in these intrusive bodies. The material forming the laccoliths enters the chamber which it occupies through a comparatively small opening (see Fig. 6), and the material in the opening solidifies soon after active movement ceases, thus effectively shutting off connection with the deeper-seated source of supply.

The individual bodies of igneous materials in the laccoliths of Utah are relatively so small, and solidified so rapidly, that conditions for differentiation were not favorable. A large accumulation of differentiation products of which the ore solutions were one is therefore not to be expected. The fact that the laccoliths had no connection with the surface, and solidified under conditions of nearly uniform pressure, may have been a factor in preventing the segregation of such liquid and gaseous differentiates with their dissolved contents as they were formed. If the material forming a laccolith or sill was intruded into hot deep-seated rocks, and solidified slowly, the conditions might be favorable to gravity differentiation such as has been called upon to explain deposits like those of Sudbury, Ont.

In the stocks differentiation was least active near the tops and on the margins where the solidification was most rapid, and most active in the interior. The heavy products of differentiation, as the iron-magnesian silicate crystals that formed early, tended to settle, whereas the volatile constituents carrying metals in solution evinced a proclivity to rise. This differentiation by settling of crystals is believed to explain the more siliceous composition of the medially truncated stocks.

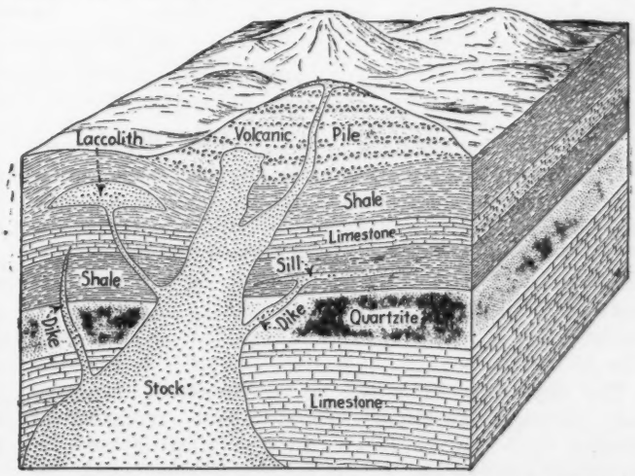


FIG. 6. GENERALIZED STEREOGRAM SHOWING DIFFERENT TYPES OF INTRUSIVE BODIES

*Publication sanctioned by the Director of the U. S. Geological Survey.

As rapidly as a crust of solidified rock formed over and around the stocks it was fissured by the movements due to solidification and other causes, and the volatile materials rising through the still fluid mass, on reaching the fissured zone, were guided along these openings till physical and chemical conditions favorable to precipitation were reached in the solidified igneous rock or the adjacent sedimentary or eruptive rocks where minerals were deposited. (See Fig. 7.) The effect of this process was to concentrate the mineral constituents resulting from differentiation in and around the tops of the stocks. Where the stocks have been deeply eroded, this zone, and with it most of the valuable ore deposits, have been removed. (See Fig. 7.)

It is possible that the concentration of metals near the apex of a stock is influenced by the relation of the magma at the time of intrusion to the surface or to the zone of fracture. If a magma containing gases held in solution under pressure is forced through the overlying rock until it connects with the surface or with the zone of fracture it is possible to imagine a condition similar to that produced by removing a cork from a bottle of champagne, when the dissolved gases move toward the region of lower pressure. In this manner there might be relatively rapid movement of previously dissolved gases into a restricted area from a large volume of magma.

The expansion of gases under decreased pressure and chemical reactions would effect temperature changes that may be factors in precipitating metallic and other substances. If the magma did not reach the surface, the influence of difference in pressure would not be effective or would be less effective. This may account for the conditions in the Park Valley district and in the Grouse Creek range where the tops of intrusive bodies (whether laccoliths or stocks is not apparent) are exposed by deep erosion, and do not appear to contain large deposits of ore.

It is not always possible to determine whether an intrusive body was connected with the surface before solidifying. There is, however, evidence that some of the stocks of Utah were so connected, notably those of the Tintic and Marysvale districts. Proof that an intrusive body now exposed had no connection with the surface before solidification is more difficult to demonstrate. There are, perhaps, criteria that would aid in such a determination, and their recognition will be valuable.

The deep-seated intrusive body of the Park Valley district contains abundant aplite and pegmatite, as does the Granite Mountain intrusive. Possibly the retention of these differentiation products means a lack of surface connection. Large ore deposits have not been found associated with these bodies. Whether aplites and pegmatites are significant or not, it may be noted that the intrusive rocks of all the districts containing large ore deposits are similar in character to those that are believed to have had a surface connection before solidification.

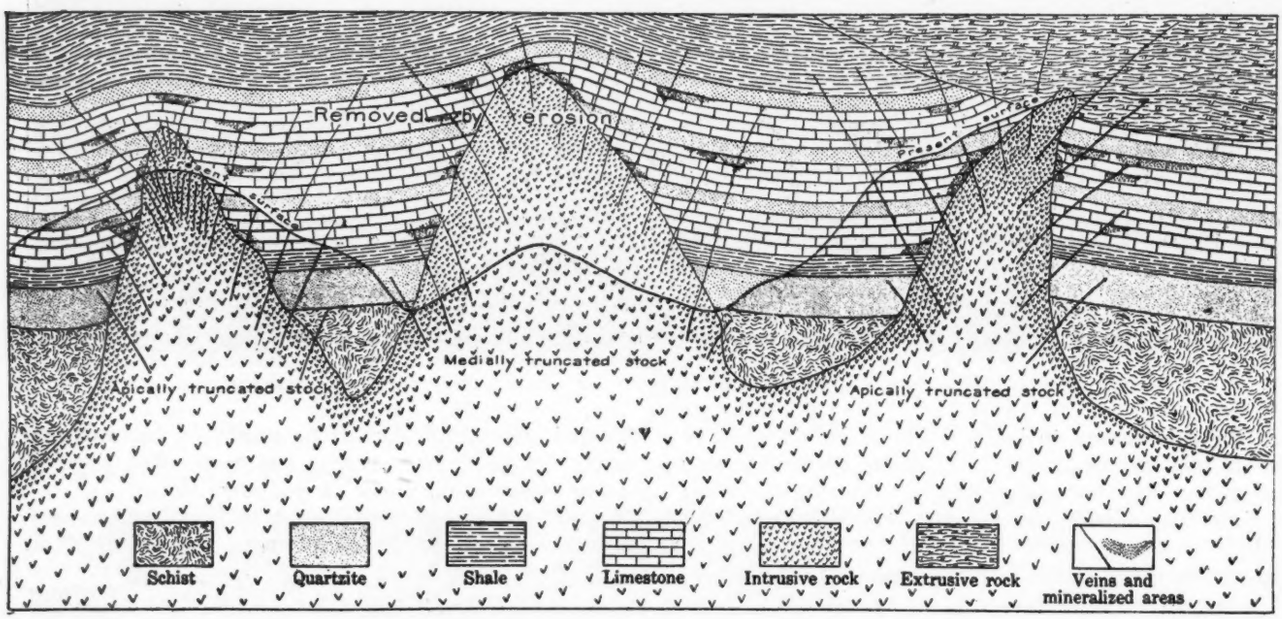


FIG. 7. GENERALIZED STEOGRAM SHOWING THE RELATION OF OREBODIES TO STOCKS.
The lighter portions of the stocks are more siliceous.

Primary sulphates in igneous rocks and in ore deposits formed at high temperature are confined to a few complex silicate minerals containing the sulphate radical. In igneous rocks these minerals are characteristic of effusive rocks and dikes as constructed with deep-seated intrusive rocks. In deposits formed at intermediate temperature barite is common, and anhydrite is abundant in some deposits. Under favorable conditions, and probably at comparatively low temperature, alunite forms abundantly. It is believed that in many deposits the sulphate of the minerals has been derived from deep-seated solutions.

The study of volcanic emanations has shown that there is a change in their composition with change of temperature. At high temperature, sulphur or sulphur dioxide may be present, but no sulphuric compounds; whereas at moderate temperature, sulphurous and sulphuric compounds may be present. Sulphur trioxide is unstable at high temperatures (at atmospheric pressure it is practically dissociated at 1,000 deg.), and the temperature range in which it forms rapidly by combination of sulphur dioxide and oxygen is stable and narrow (approximately 250 to 600 deg. C. under at-

mospheric pressure). If free oxygen and sulphur or sulphur dioxide are present in igneous emanations, it would be expected that, in cooling, sulphur trioxide would form and that at suitable temperature the sulphates would also form.

Sulphuric acid can also be formed readily by the reduction of ferric solutions and sulphur dioxide. If emanations contain no free oxygen, that element may, combined with the metals or with hydrogen at high temperature, together with sulphur, form the oxides of sulphur and sulphuric compounds at lower temperatures.

HEAD OF LITTLE COTTONWOOD CANYON ALTA DISTRICT, WASATCH RANGE

That this reduction of metallic oxide and oxidation of sulphur compounds can take place is indicated not only by experimental data but by the abundance of ferric compounds in igneous rocks and mineral deposits formed at high temperature, though those ferric compounds are not only commonly absent in veins formed at moderate temperature, but in the adjacent wall rocks have been largely reduced. In contrast to this, sulphuric compounds are only sparsely represented in igneous rocks and mineral deposits formed at high temperature, but are frequently abundant in deposits formed at intermediate and low temperatures, and in many deposits are associated with abundant ferrous and manganous compounds. Such changes may be observed in a single deposit that has continued to form over a wide range of temperature, as that of the Cactus mine of the San Francisco district.

The alunite veins at Marysvale appear to have been deposited from deep-seated (hypogene) solutions, and it seems probable that in their formation the sulphur in the solutions was oxidized to sulphuric acid, which acted on the felspathic rocks adjacent to the fissures and formed the potassium and aluminum sulphates that entered into the alunite.

The interchange of oxygen between certain elements and sulphur, with varying physical conditions, is believed to be an important factor not only in the formation of sulphates in solutions of deep-seated origin but also in the precipitation of other primary (hypogene) ore minerals.

Before the main period of ore deposition, parts of the region had been deeply eroded, and rocks ranging from pre-Cambrian to Cretaceous age were exposed at the surface, so that the age of the rock is no trustworthy indication of its depth below the surface at the time ores were deposited. Replacement deposits occur in rocks ranging in age from pre-Cambrian to Jurassic, and their relative importance seems to depend on chemical composition and physical character, and the relation to intrusive rocks rather than upon age.

The limestones were generally more readily replaced than the siliceous rocks, as is plainly evident in the Bingham, Park City, Tintic and other districts. In a series of limestone beds those composed essentially of calcium and magnesium carbonates were more readily replaced than the siliceous or shaly beds. This relation is illustrated in many of the districts of the state. Some particular feature may control in certain deposits; carbonaceous shale, for example, appears to have been most potent in precipitating gold from the solutions that traversed the rocks of the Mercur district.

Importance of Physical Condition of Rock

The importance of the physical condition of rocks as a factor in determining their susceptibility to replacement can hardly be overestimated. In many instances it appears to more than counterbalance unfavorable chemical composition, and where favorable chemical composition and physical character are combined in the same rock, bonanza deposits have resulted. Highly jointed brecciated or crushed rocks, where impervious gouge does not prevent access of metalliferous solutions, have uniformly proved favorable to ore deposition. Among the important deposits in such material are the great disseminated copper ores of the Bingham district, in highly jointed monzonite; the copper deposits of the San Francisco district, in brecciated quartz monzonite; the lead-silver-zinc-copper deposits of the same district, in brecciated latite; the deposits in crushed quartzite, in and adjacent to fissures in the Park City, Bingham, and other districts, and the deposits in brecciated limestone in the Cottonwood and other districts. In numerous instances a close inspec-

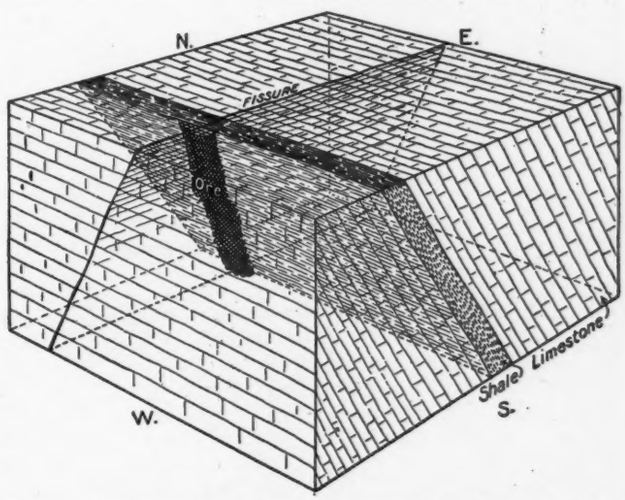


FIG. 8. STEOGRAM ILLUSTRATING THE RELATION OF ORE SHOOT TO IMPERVIOUS ROCK

tion of an ore bed has shown that the selective replacement has been in part at least due to the fact that the replaced bed has experienced greater shattering adjacent to the fissure than the overlying or underlying beds.

The presence of impervious rocks may exert an important influence on the location of oreshoots. This is shown in the replacement of beds underlying shale, as in the Star district (see Fig. 8), or underlying a dike

or sill, as is shown in the Fish Springs, Ophir, and other districts.

The basin character of part of the area which has resulted in a greatly varying position of the water table has caused an unusual complex cycle of alteration by surface agencies in some of the deposits. Nearly all types of deposits have been both enriched and made more amenable to metallurgical treatment by the natural process of concentration.

In nature, as in smelting, starting with a sulphide ore, the process is essentially one of oxidation. This, however, affects very differently the various metals in the ores.

Under the conditions that have prevailed in the regions, gold has moved little during the process of oxidation, but has undergone residual concentration in the gossans, as in the Bingham district, and the gold of the gossan may have been later concentrated in places. Moreover, the natural process of oxidation has eliminated one step in the metallurgical process. In the Mercur district the unoxidized ores required roasting before cyanidation, whereas the oxidized ores could be treated without roasting.

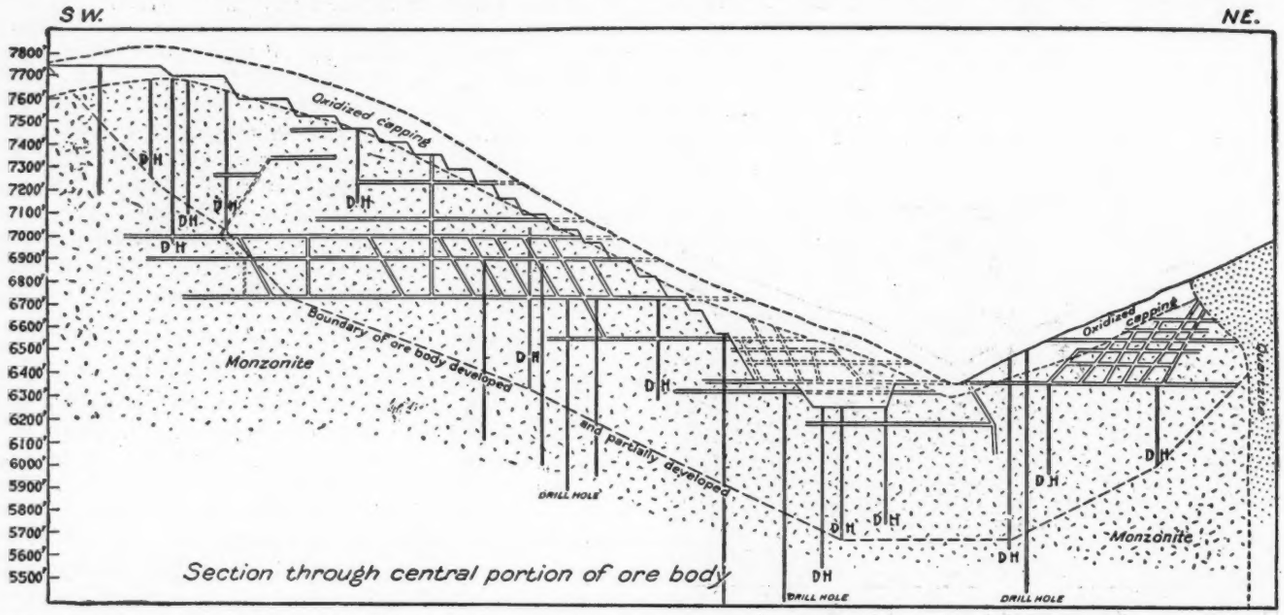


FIG. 9. SECTION THROUGH DISSEMINATED DEPOSITS O F BINGHAM DISTRICT SHOWING OXIDIZED CAPPING AND ENRICHED SULPHIDE ZONE
From Utah Copper Co. annual report

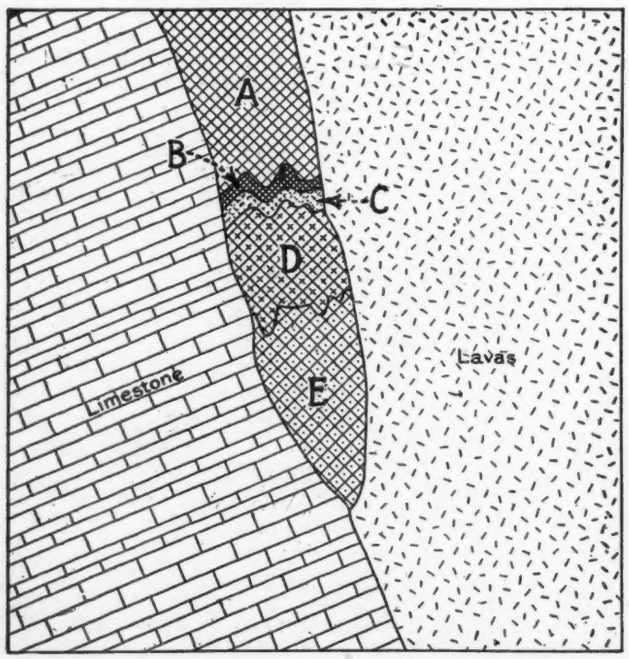


FIG. 10. GENERALIZED SECTION, SHOWING TYPES OF ORE IN THE HORN SILVER MINE
A, oxidized lead-silver ore; B, oxidized copper ore; C, secondary copper sulphide ore; D, Secondary zinc sulphide ore; E, primary sulphide ore

Silver, like gold, has apparently moved little under the prevailing conditions. This is probably due to the fact that chlorides are abundant in the region, and enough are present in the waters to convert all soluble silver salts that form to the slightly soluble silver chloride. As in the case of gold, there has been some residual enrichment, and the metallurgical treatment of the ores was much simplified.

Lead, upon oxidation, forms slightly soluble salts, mainly the sulphate or carbonate, and has migrated little. As with the metals previously mentioned, there has been residual enrichment, and the oxidized ores were amenable to the simple metallurgy that was possible in the early days of mining.

Copper, which forms readily soluble and also slightly soluble salts, shows much variation in movement. Where abundant limestone or calcite is present in the deposits, the copper resulting from the oxidation of the original minerals forms the slightly soluble carbonate, and there is comparatively little migration. Where the gangue is mainly silicate, the soluble salts migrate downward and are re-precipitated, forming a zone of sulphide enrichment, as in the disseminated deposits of the Bingham district and in the Horn Silver mine, as shown in Figs. 9 and 10 respectively. Much of the copper ore of the state has resulted from the enrichment of material originally too low in copper to be mined profitably.

Zinc, like copper, forms both soluble and insoluble

salts. Under favorable conditions the zinc content of complex sulphide bodies has been concentrated into valuable deposits, but under unfavorable conditions it has apparently been disseminated and lost. The most favorable conditions appear to exist where the soluble salts, in their migration, pass into readily replaceable limestone, by which the zinc is precipitated mainly as carbonate, as shown in Fig. 11-A. Where the solutions carrying the zinc pass into siliceous rocks (see Fig. 11-B) the zinc is too much disseminated to form ore. Under rather exceptional conditions, as in the Horn Silver mine, zinc is precipitated in the sulphide zone, as wurtzite, and thus forms a zone of enriched zinc-sulphide ore.

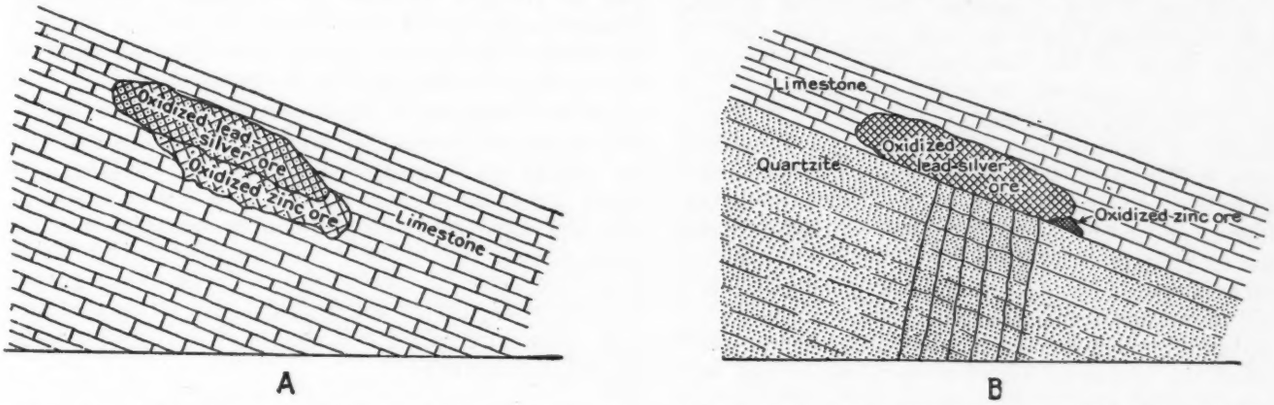


FIG. 11. A, CONDITIONS FAVORABLE TO THE FORMATION OF SECONDARY ZINC ORES; B, CONDITIONS UNFAVORABLE TO THE FORMATION OF A SECONDARY ZINC ORES

Mining in Rhodesia in 1918

Output and Dividends Decreased, Owing to War Conditions—Wankee Colliery Unable To Meet Demand for Coal—Influenza Made Heavy Inroads

THE mineral production of southern Rhodesia in 1918 was as follows, according to the report of the Secretary of Mines: Gold, 631,358 oz.; silver, 175,722 oz.; copper, 3,254 lb.; coal, 491,268 tons raised, 285,312 sold, 119,701 coked; chrome ore, 31,286 tons; asbestos, 8,574; ironstone, 6,355; wolframite, 11; scheelite, 26; arsenic, 114; antimony, 15; barytes, 54 tons, and diamonds, 449 carats. The value of the total mineral production in 1918 was £3,456,321, or £1,183,014 less than in 1917.

Ten mines produced over 10,000 oz. of gold in 1918, Shamva yielding 89,780; Globe & Phoenix, 82,283; Lonely, 49,561; Cam & Motor, 39,640; Falcon, 33,282; Rezende, 29,690; Eldorado, 29,348; Antelope, 18,405; Gaika, 15,645, and Fred, 14,129. Gold quartz crushed was 1,966,974 tons. Two large gold mines closed down late in 1917. Rising prices for stores and supplies and the absence of many claim-holders on active service also caused the closing down of many small mines.

A very rich shoot of gold ore was opened in the Rezende mine, at Umtali. The Globe & Phoenix mine continued its prosperous career, and the Lonely mine, at Bemberi, disclosed rich ore in the lower levels between 1,500 and 2,000 ft. vertical depth. It is rather amusing to note that not so very long ago this mine was cited as an example of "impoverishment in depth"!

The Wankie Colliery was seriously short in its coal output during most of the year, owing to an outbreak of tropical ulcers, which reduced the labor supply; to shortage of cars, and to the urgent Imperial demands at Beira for bunkering; also to the constantly increasing demand for coke for the Katanga copper mines and the need of the Rhodesian railways. Rhodesian mines depending on coal for fuel had often to go short and hang up stamps. "The strain on this colliery to meet increasing demands seems to be too great," runs the report. "The coal measures at Wankie are practically unlimited, and the coal is of excellent quality; but the necessity of opening up another colliery at Wankie with adequate equipment becomes more and more apparent."

The supply of wood and timber in the mining districts is causing anxiety, as no reafforestation methods are practiced. During the last quarter of the year Spanish influenza paralyzed the industry. Natives died or deserted, and would not re-engage until they had visited their kraals to see how their relatives had suffered. In October and November, 1918, deaths in the mines amounted to 3,000 and desertions totaled 7,300. The loss to the mineral industry was about £400,000. The average number of native laborers employed was 32,766, and the death rate, which was greatly increased by influenza, was 110.76 per 1,000! The monthly average number of Europeans employed was 1,452.

The Odzi River bridge on the line to Beira, the shipping port, was carried away by flood, stopping exports of base metals for several months. Prospecting was at a standstill, and organized prospecting is required. A valuable area, however, containing vast deposits of chrome ore and some high-grade asbestos, was discovered in Lomagundi district forty miles from the railway. Scheelite was discovered in large quantities in and around the Golden Valley mine, in the Gatooma district, and also near Umtali.

The main copper producer was the Falcon mine, with 3,033 tons. The Lomagundi area shows promise as a copper producer. The Selukwe mines produced tin-chrome ore. Arsenic is now produced from a mine near Bulawayo and another near Umtali. The bulk of the production was sold in the Transvaal to the B. S. A. Explosives Co. which makes cattle dip. Platinum was discovered in the precious-stones wash of the Somebula district.

Dividends declared by mining companies in 1918 totaled £615,640, compared with £691,260 in 1917. These figures do not include profits made by small workers.

A. I. M. E. Banquet

THE banquet which is an annual feature of the meetings of the American Institute of Mining and Metallurgical Engineers was held this year in the Gold Room of the Congress Hotel, Chicago, on Sept. 24, 1919, and was attended by more than six hundred members and guests. Captain R. W. Hunt officiated as toastmaster, and introduced President Horace V. Winchell, who urged engineers to exert their influence toward the proper solution of public problems, and admonished them not to neglect their duties as citizens while engrossed in their professional activities. Mr. Winchell's address is published in full elsewhere in the Journal.

Captain Hunt discussed conservation, and pointed out that the conservation of mineral resources was more important than the conservation of our forests, because the forests could be replaced within a measureable period of years, whereas the minerals, once removed from earth, or wasted, represented a permanent loss. He advocated the conservation of human life first, natural resources second, and capital third, and expressed the opinion that if laws were enacted to take care of the first two, capital would take care of itself. He thought that the nationalization of coal mines would be the greatest hardship ever put upon the people of the United States, and that the most effective way to conserve coal would be to tax the coal left in the form of pillars in the ground in the process of mining.

Commander Taublet, of the French Navy, delivered an address wherein he compared interesting mineral statistics of the United States and France, and pointed out France's great need for coal, and her willingness to exchange iron for coal.

Mayor Theodore W. Robinson welcomed the Institute on behalf of the city, and delivered an interesting eulogy on "Chicago the City of Destiny," in which he called it the world's larder and granary, and the greatest railroad center because of its twenty-seven trunk lines. In referring to the duties of the engineer, he urged the preaching of the gospel of hard work, thrift and loyalty. He advocated the open shop, and called the steel strike "foreign radicalism transplanted."

BANQUET A. I. M. E., CONGRESS HOTEL, CHICAGO, SEPT. 24, 1919.

Secretary Bradley Stoughton expressed, on behalf of the Institute, hearty thanks to Chicago for its cordial hospitality, and said that the meeting broke all records in point of attendance.

Charles M. Schwab delivered an entertaining address, in which he urged engineers to give more attention to the science of human engineering. He extolled the efficiency of American industry during the war, and referred to the so-called German efficiency as a great fallacy. He said that one way to reduce the high cost of living was to practice economy and efficiency, and that the surest cure for our industrial unrest was "an honest day's work for an honest day's pay."

Address of Horace V. Winchell at A.I.M.E. Chicago Meeting

AT THE BANQUET held on the evening of Sept. 24, at the Chicago meeting of the Institute, President Horace V. Winchell delivered the following address, which is here presented in full:

Ladies and Gentlemen: On behalf of the members and directors of the American Institute of Mining and Metallurgical Engineers, I desire to express our appreciation of the diligent labors and many thoughtful courtesies of the Chicago members which have culminated in this splendid gathering here tonight. We have enjoyed the cordial atmosphere of welcome by which we have been surrounded; we have profited by the interesting discussions of the past three days, and we shall long remember with gratitude the manifestations of friendship which have attended our brief sojourn in Chicago.

We look upon these, our annual mid-year gatherings in different sections of the country, as one of the most effective agencies in the forming of acquaintance with many whom we might otherwise never meet. In this way are brought together men of common aims and similar lines of investigation, and through the interchange of ideas and the friction of personalities are often developed a warmth of interest and a fruition of conception which lead not only to lifelong friendships but to results of importance in our social and economic development. Those of us who were here in 1893 and listened to the reading and discussion of Posepny's paper on the genesis of ores received an inspiration and a stimulus which perhaps have played no small part in the vastly greater study and the clearer understanding of that subject which in the past quarter of a century have been marked by a progress greater than that of all antecedent time. Nor is this the only epoch-making monograph which has first been promulgated at our meetings. I have no doubt whatever that some of the ideas advanced in our technical sessions this week contain germs of thought susceptible of great future elaboration, and that these germs, if not already fully developed, will bear rare fruit in succeeding years. May we not therefore congratulate ourselves and thank our hosts in this great metropolis because of this record-breaking attendance here this evening? Truly a high mark has been set in the history of Institute events.

In glancing backward over the last twenty-five years we become conscious of many changes, not alone in the scale of production and in methods of operation but also in the more intangible but none the less important conception of the relation of the engineer to society in general and more especially to his own particular community. Although it is to be feared that there is some foundation for the statement recently made to the chairman of the National Service Committee of the Engineering Council [1] by "an acknowledged statesman and keen observer of events," that "Engineers are the most unresponsive citizens that we have. . . . Their aloofness and indifference in all matters outside of their own professional sphere are among the unexplained things in our political life," yet there are signs of an awakening, and the future is not without promise.

Our Institute itself, an organization which was for many years forbidden by the organic law from exerting any influence on law-making bodies, or even presenting its views as an organized unit of professional men regarding any movement which affected the general community, has recently removed these restrictions and is now able legally and with perfect propriety to appoint its committees and representatives to lend professional advice and assistance to any and all public and governmental agencies which may in any way shape and control legislation and national activities.

Recent events have shown us that the fabric of human relationship is each year more closely interwoven. The strands are ever closer and more firmly drawn, and each separate thread is a sensitized nerve alive with electricity and communicating instant warning of danger and news of damage to every other vital part. The development and perfecting of means of communication and transportation, and the arrival of an industrial age, have made all the world neighbors; and just as a fire in your neighbor's house is always a matter of concern to you, so an incipient conflagration of social or economic unrest or disorder in any part of the civilized world has now come to have its effect upon every other part.

I have said before, and it cannot be too often repeated, that from the historic moment when Admiral Dewey sailed into Manila Bay and upset the coffee cups of the Spanish Navy, we, the United States of America, are by force of natural law, and whether we wish it or not, partners in the commonwealth of nations. We may legislate against it; we may make treaties with reservations, or no treaties at all; we may set up barriers and lock the doors against all foreigners, black, white or yellow; but if because of our acts, or for any other reason, these excluded and distant peoples engage in conflict among themselves, we shall again, in spite of our wishes, our barriers and our padlocks, be drawn into the fray.

Nor is it in time of war alone that we find ourselves indissolubly harnessed up with the rest of mankind. Each smallest fluctuation in the annual production of the farms of Europe or of Argentine is reflected in our markets. Each drouth or famine, each outburst of Bolshevism, each overthrow of a tyrannical government in any part of the globe, affects each and every one of us, down to the youngest babe in its cradle or the poorest-paid worker in a sweatshop. Social diseases of the body politic are like the influenza: they are pandemic,

[1] Engineering and Mining Journal, Sept. 13, 1919, p. 439.

they are in the air, and are not excluded by bolts nor barred gateways, by statutes or standing armies.

Nor may we blind our eyes to the fact that at the present time, under the order of divine providence, the United States is the only great nation whose resources are not only unimpaired but incomparably greater than ever before; that the nations of Europe are exhausted and almost bankrupt; that it is our privilege and our duty to them as well as to ourselves to go to their rescue. This was made so clear by our illustrious member, Herbert Hoover, in his address at New York last week, that it requires no emphasis from me. I presume each of you will soon receive that address in printed form. I advise you to learn it by heart and to lend it to all your friends. I wish that it could be read by every intelligent person between the Atlantic and Pacific; that it could be used as a text by every minister, and as a reading lesson for a week in every highschool. It emanated from a heart wrung by the woes of suffering millions and from a brain clear enough and broad enough to analyze the causes for Europe's condition and to perceive clearly the only remedy.

It is a source of inspiration to us, and one of supreme gratification to all engineers, that in a time of crisis, in a period that tried men's souls, at a moment when the real man comes to the front and assumes that position of leadership to which, by his mental attributes and moral courage he is naturally entitled, it should have been a mining engineer to whom the world turned for relief, and that for his trusted and most effective coadjutors he chose many other engineers. Does this not suggest to us that engineers are needed in the settlement of the world's affairs? Do we not realize that there is prevalent, as an aftermath of war and the artificial conditions created by it, a widespread feeling of discontent? Are we not still, and more than ever, ready to apply to the solutions of post-war problems the mental poise and balanced judgment which are a part of the equipment of the trained engineer? Shall we be so modest and retiring or so engrossed in our technical duties as to forget or neglect our duties as citizens?

Just at this point my subliminal ear detects a murmur. What do you say? "We cannot all be Hoovers or presidents or Members of Congress"? No, of course not! But you can help to make or unmake them, to influence them, and to shape the policies of government and the destinies of nations. Why is President Wilson touring the country today? Is it not to shape public opinion? He knows that the world is ruled by ideas, and that there is no greater force than public opinion. Suppose all the engineers of this broad Republic should unite and devote all of their spare time and energy for six months in advocating some change in our statutes which clearly appealed to their sense of equity as promoting the public welfare: do you not suppose they could speedily overcome the apathy and selfish inertia of our chief law-making body? Of course, they could. Well, it would not be you or I, but all of us, who would have done it. It would be the result of co-operation and organized effort, in which each individual pulled in the same direction and not at cross-purposes with the rest.

Now, this is all trite; and in one form or another has been said many times. You want perhaps to know just what particular move to make next, and just how and where to begin. And these questions I cannot answer; but I may, with your permission, make a few suggestions.

There are problems of public character constantly before us, and yet of direct and vital importance to each one of us engineers. Some of these problems are comparatively local in their sphere of bearing and application; some are nation-wide, and some of them are international in scope. We have, for example, in each state and county, local taxation questions. As applied to mines and quarries, to mills and smelters, and to many other industrial plants, the valuation of properties for taxation involves questions which require engineering ability of high order, and keen analysis by the best brains of the country. The same problems are now presented in connection with the Federal Income Tax Law. Indeed, there are few subjects of wider general bearing and importance, nor any which make more pressing demand upon the engineering talent of the land. That we were not consulted in the framing of the law is perhaps due largely to our lethargy and apparent indifference. We are now confronted with its interpretation and proper application, and should not fail to give to the governmental authorities the benefit of our most serious consideration and competent advice. We are glad to be called into conference, and must willingly embrace the opportunity to aid in placing all interests involved on the most nearly equitable basis.

Then there is the ever-present and just now unusually inflamed antagonistic struggle between the employee and the employer. I know of no more promising work for engineers, with their peculiar adaption for studying the elements of a complicated situation, for determining the relative importance of its factors, for picking out the particular operating defects, and for suggesting solutions to difficulties. Conflicts generally arise through lack of mutual understanding and consequent lack of confidence. Where there is perfect understanding among fair-minded men there will be confidence, and where there is confidence, difficulties can be adjusted without strife. It seems to me that engineers may be of inestimable service to all classes by exerting the influence, which they undoubtedly possess, toward the education of the hostile elements as to the real necessities and actuating motives of the other. We are consumers; we are a portion of the public which always suffers in these industrial conflicts. We are coming to believe that no element in the community should be permitted to throw our entire industrial machine out of operation; that some control should and must be exercised to prevent these recurring disasters to the peace and prosperity of the country. The subject is one which demands the attention of all thoughtful and intelligent citizens, and is to be settled, if at all, only by concerted effort.

In broader fields we see the need of engineering brains and attention in the world-wide control and distribution of mineral resources. Recent thoughtful discussions by Messrs. Leith and Spurr have shown us that the United States has important duties to its own people and to the people of other countries in connection with the commercial control of minerals. It will be generally admitted that, until very recently, our people have been so busy in developing our own resources that we have paid little attention to those of other countries. It is also a fact that our policy of insularity has tended to discourage investments abroad. The studies of world conditions which we have been forced to make within the past few years have made it clearly evident that we must wake up and protect ourselves and our industries in their relation to the raw materials for manufacture and world-wide distribution. Our resources must not be dominated by foreign capital, and we must acquire our necessary share of those which can be controlled by us abroad. As Spurr[1] wisely says:

"Such mineral wealth as we possess in an exportable surplus must be managed for our best advantage. Such minerals as we do not possess in quantities sufficient for our own needs, must be secured to us so far as possible by a definite and intelligent governmental policy."

Other governments have already passed laws debarring us from owning or operating oil-producing properties and mines of various sorts within their territories. We have done little or nothing along these important lines of security and protection for the future.

Finally, it is for us to remember that we are not only engineers but Americans; that "America is worth saving not only as a land in which men and women may be free and increasingly prosperous, but as a land and a government under which character can be built, individual capacity given opportunity for free exercise, and co-operation on the widest scale promoted not only for private advantage but for the public good." [2]

Let us not forget that "socialism is the twin brother of autocracy, and, like autocracy, it is the deadly enemy of republicanism and of individual liberty." Let us stand firmly for the principles of equal rights and justice for all, and have full confidence in the destiny of our country. Thus alone shall we come up to the full measure of the possibilities of our profession and our duties as American citizens.

Special Meeting of Denver Members of A. I. M. E. at Chicago

One of the pleasant features of the A. I. M. E. meeting in Chicago was the reunion luncheon of the Denver and ex-Denver members of the Institute at the Congress Hotel, on Sept. 23, attended by twenty-two engineers, many of whom are now active members of the Denver Section. The meeting was called by H. B. Lowden, of the Colorado Iron Works Co., Denver, and Secretary of the Teknik Club, of Denver. H. C. Parmelee, editor of Chemical and Metallurgical Engineering, and formerly secretary of the Teknik Club, presided. Other members in attendance were John V. N. Dorr, the Dorr Co., New York; Walter G. Swart, Duluth, Minn.; A. M. Plumb, manager Wisconsin Zinc Co., Patteville, Wis.; Chester H. Jones, Chicago editor Chemical and Metallurgical Engineering; E. R. Ramsey, The Dorr Co., Denver; R. B. Moore, U. S. Bureau of Mines, Golden, Col.; D. J. Roach, Great Western Sugar Co., Denver; L. F. Miller, University of Minnesota, Minneapolis, Minn.; Will H. Coghill, U. S. Bureau of Mines, Seattle, Wash.; S. J. Osborn, Great Western Sugar Co., Denver; S. C. Lind, U. S. Bureau of Mines, Denver; W. A. Mitchell, assistant chief engineer Great Western Sugar Co., Denver; P. M. McHugh, Western sales manager The Dorr Co., Denver; S. A. Ionides, Denver; Arthur G. Dwight, New York; H. N. Stronck, Chicago; and John L. Malm, W. E. Malm, R. A. Malm and Harry J. Wolf, the Malm-Wolf Co., Denver.

The chairman referred to the meeting as one of the numerous reunions of engineers that contribute toward the success of the A. I. M. E. meetings. A renewal of old friendships was followed by a discussion of industrial relations, in the course of which there was a general expression of progressive sentiment. It was agreed that every important industrial contract of the future would be drawn with due consideration for (a) labor, (b) capital, (c) management, and (d) the community.

Chile Copper Co.

The tenth quarterly report of the Chile Copper Co., covering the second quarter of 1919, states that on account of the condition of the copper market the company's operations remained curtailed to approximately a 50-per cent basis. The production of copper for the quarter averaged 5,030,951 lb. per month, as compared with 5,169,641 lb. per month during the first quarter of 1919.

During the quarter ended June 30 there was treated 511,502 tons of ore, averaging 1.69 per cent copper; in the preceding quarter there was treated 648,203 tons, averaging 1.57 per cent copper. During the quarter 10,533,846 lb. of copper was sold and delivered out of a production of 15,092,852 lb. In the preceding quarter the copper sold and delivered totaled 3,971,849 lb., out of a production of 15,508,924 lb.

The average price realized for copper during the quarter ended June 30 was 15.933c per lb., as compared with 18.724c per lb. for the preceding quarter. For the quarter ended June 30, the cost of copper produced, including depreciation and all general expense, but excluding delivery and selling expense, excess-profits tax, obsolescence and depletion, was 12.69c per lb., as compared with 15.25c per lb. for the first quarter of 1919. Including all excluded items except excess-profits tax and obsolescence, the cost figured on copper sold was 21.520c for this quarter, against 30.355c for the first quarter of 1919.

[1] The Scientific Monthly. July, 1919, p. 80.

[2] Nicholas Murray Butler, in an address before Cincinnati Commercial Club, April 19, 1919.

The Gold Situation*

Present Juncture of Financial Affairs Compared With Conditions Succeeding Civil War Period—Importance of Stimulating and Encouraging Production of Gold—Effect Of Present Expansion of Credits

By John Clausen

A GREAT MAN once said, "Necessity opens our eyes to the advantage of fresh principles," and as I see it this is now the position in which we, as other nations, find ourselves. The greatest war the world has ever seen has so altered conditions that methods and customs different from those heretofore known or used must necessarily take the place of the old in order to keep abreast of the new order of things. In reality, a very important issue is presented as to whether the standard of value of the world will in future be gold or become a combination of silver and gold, and if so, what effect such changes would have on the trading powers of nations. It is obvious that if a bi-metallic standard were adopted as media, the question of the value between the metals themselves would become one of vital concern. Then again, for the actual needs of people there may be a scarcity of gold circulating as money for trading purposes, or as affecting the position of governments and banks and the availability of the precious metal in proportion to liabilities.

Greenback Currency of 1862

There are many interesting angles from which to view this important subject, but it may be of general benefit to here recount what happened in this country during and after our Civil War.

As an inevitable result of the Government policy which had placed upon the banks a burden too heavy for them to carry, the financial institutions in New York and other sections were, during the Civil War, forced to discontinue specie payments, which subsequently brought about the suspension of the National Treasury. At the beginning of 1862 a bill was introduced which had for its purpose the making of Government notes legal tender, and although that measure was considered unconstitutional it became law in February of the same year. The issue of greenbacks payable to bearer, after several amendments of the bill, was authorized up to a maximum of $400,000,000. When the greenbacks were put out, it was expected that they would circulate at par with the gold dollar, containing 23.2 grains of pure metal, but a year after the first Legal Tender Act had been passed paper money had an exchange value equal to only 14.5 grains of gold. Its value rose in August, 1863, to 18.4 grains, but fell in July, 1864, to 9 grains, which appears to have been its lowest point. The premium on gold was then such that a dollar in paper money was not worth more than 36 cents in gold coin.

The most striking example of profiteering during that period was the Black Friday Conspiracy of September 24, 1869, when a group of speculators bought up large quantities of gold—creating an artificial scarcity—and as a result that commodity could be obtained only from this clique at ruinous terms. This brought about many failures, and to check gambling in gold and reduce the premium on it, the Anti-Gold Law was passed; but as it did not materially bring the premium on gold to a lower level, it was very soon repealed.

In June, 1862, Congress authorized the use of "Postage and other stamps of the United States" as money because of the demand for small currency, notwithstanding the circulation of the so-called "shinplasters," which were issued in denominations of 5, 10, 20, 25, and 50 cents.

California Alone Maintained Specie Payments in Civil War

In some of the Western states attempts were made to maintain specie payments—after they had in the main been given up in the Eastern states—but California alone has the distinction of remaining on a sound metallic basis during the Civil War. In New York some of the banks felt confident of ability to continue paying cash, but none did—if the records are complete—with the exception of the Chemical National Bank. It was not until 1876 that gold again sold at par throughout the United States.

The Crisis of 1893

Since that period the more notable event was the panic of 1893, which was followed by a depression throughout the nation, with the result that a large amount of gold was drained from this country to Europe. The Treasury's reserve became so low in November, 1894, that a sale of Government bonds was resorted to; in fact, the stock of coin was reduced to such an extent that there were outstanding more gold notes than coin, leaving a part of the certificates represented by bullion in the form of bars. Again, during February, 1895, and also in July of the following year, strong syndicates headed by leading bankers in New York accomplished the difficult task of bolstering up the finances of the United States Government, and it was largely due to their activities that the United States remained on a gold basis. The success of these combinations had a far-reaching influence on business, and as as soon as it was seen that the gold obtained from abroad was not going to be lost at once, as in previous bond sales, confidence was again revived, and the financial position of the United States improved so favorably in the eyes of Europe that it was possible to float large holdings of American securities abroad.

The Gold Pool of 1914

In August of 1914 foreign exchange became demoralized, and to remedy that situation a gold pool was created, when influential banks and bankers throughout the country joined in an agreement to provide mail and telegraphic transfers to Europe in lieu of gold for export, which proved a helpful factor in restoring order and confidence.

*From the *Chemical Bulletin* of the Chemical National Bank, Aug. 16, 1919.

For several years prior to the declaration of war in Europe, France, Russia, and Germany especially had been engaged in an eager competitive scramble for gold, which resulted in the holdings of their great state institutions increasing rapidly. On this account, at the outbreak of hostilities, we found them with what was up to that time the peak of their gold reserves.

The embargo which was universally adopted clearly demonstrated the desire of every commercial nation to control and retain its supply of gold. As far as the United States was concerned, other than the necessity of obtaining Government permission to export gold in coin or bars, its circulation in this country has not been restricted—although the efforts of banks and individuals alike have been directed toward harmoniously coöperating with the Government in concentrating the nation's supply with the Federal Reserve banks.

Where Gold Is Not Acceptable

One of the most curious economic features of the present situation is the strong light which it has thrown on the fact that it is possible to have too much of a good thing, even when that thing is gold. This is forcefully demonstrated if we glance at the financial position of the Scandinavian countries, where the law has been carried so far as to relieve the government banks of the statutory obligation to buy gold and coin from all those who bring it in. This naturally prevented other countries dealing with Scandinavia from paying for purchases in gold, and the barter of commodities was the only means open for concluding commercial transactions.

It has lately been said that the world is divided into two classes of countries: those which decline to accept gold and those which refuse to part with it. Sometimes it is asked how anyone can possibly refuse to take gold in payment, but this is explained by the statement that gold in bars or foreign coins is not legal tender anywhere. No person in Scandinavia, for example, could be made to take gold bars or American eagles in reimbursement for goods to meet a required payment in legal tender currency of Denmark, Norway, or Sweden.

The Present Credit Inflation

The issue and circulation of paper credits throughout the leading nations of the world has been proportionately far greater than their holdings of gold, and this state of affairs has naturally resulted in inflation on an alarming scale. The thought, however, that European nations may possibly repudiate part of their war debts for the sake of reducing the amount of currency outstanding against government bonds or notes, is obviously superficial. Finance has become an international rather than a national question, and the monetary history of any country tends to become more and more merged with that of the whole civilized world.

International credit is firmly established on a gold basis, and no country has any interest in upsetting the present standard, although it is contended that, notwithstanding a great production of new gold, it may not necessarily assure universal gold standardism, as it would be a mere drop in the bucket of our future needs. If the world's credit, therefore, is to be carried on with gold, every ounce that can possibly be produced will be required as a basic foundation upon which international and national finance has been reared.

The production of gold is a vitally essential industry, which, for obvious reasons, should be promoted to the fullest extent. It is very apparent, however, that with a fixed value for the yellow metal, together with the rapidly increasing cost of material, labor and transportation, this particular industry as now developed is seriously affected, and it would seem inevitable that unless some form of Government relief is given to the producing mines, many of them will be compelled to discontinue operations.

In a letter addressed to Charles A. Sulser relating to the present conditions concerning the production of gold in Alaska, the Secretary of the Treasury clearly voiced the attitude of our Government when he stated: "I fully appreciate that with the rising cost of raw material and labor and with a fixed value for their output, the gold miners are facing difficult conditions. I should be sorry, however, if for this reason there were any relaxations in the effort to produce gold. At no time has this country so much required the largest possible production of gold as at present. . . . In order to place the the enormous amount of Government bonds required to finance our war expenditures, a large credit structure will inevitably be erected in our gold reserves, and it is necessary that these reserves—which are the foundation of the structure—shall be maintained on the broadest possible basis."

Effect of Increasing Price of Gold

There are people who argue that if the Government would agree upon a plan to increase the value of gold from $20.67 to say, $30 or $40 a fine ounce, it would make a settlement of obligations possible with only half the metallic requirement otherwise necessary to redeem outstanding paper credits. This course, radical to say the least, would have a disastrous effect upon all credits and especially reflect upon the cost of living, which, in all probability, would climb to limits beyond the reach of the average citizen. Increasing the value of gold or giving it at premium does not necessarily give it a higher purchasing power, but, on the other hand, in the final adjustment seriously disrupts the basis of international credit.

When peace is finally restored all the world will be faced with a period of great financial and industrial uncertainty, and to pass through it successfully will be a task that will need all the statesmanship civilization can muster. To increase this uncertainty by tampering with the standard of international payment would be an extraordinary futile means of handling the situation, and only make the confusion worse confounded.

The principal nations of the world have adopted gold as the basis of their currency systems. The market price for it is everywhere the same and equally certain at the standard price of $20.67 a fine ounce. It may be an anomaly that economic civilization should depend for means of payment on the supply of a particular metal, but it will take much ingenuity to find a practical substitute for gold and secure for it the popularity and confidence that this precious metal commands. The mere fact that it has been chosen by the most enlightened commercial nations is strong proof that it is the best single commodity for practical use as a standard.

The disproportionate distribution of gold among world nations attracts attention to the study of the part that this metal plays and is to play in future in the world's economic affairs. It is apparent to the careful observer that the pace at which the production of gold

increases is not as fast as the rise in value of the world's wealth.

The vast obligations piled up by nations, the huge issues of paper currency, the refunding of debts and resumption of specie payments are among the most urgent and difficult problems with which the world is now confronted. This makes it only too apparent that gold is a necessity for the credit and financial unity of nations, and it is essential that an adequate foundation of gold be created to uphold that system.

One of the first acts of the British government after England was plunged into war was to insure that the gold turned out of her mines should be safeguarded, and steps were taken for the deposit of new holdings in Canada, South Africa and Australia to the credit of the Bank of England. This arrangement had many advantages and tended greatly to facilitate the concentration of the metal where it was needed for the settlement of liabilities, and Great Britain has in this way used her gold unsparingly to meet immediate obligations.

The enormous increase in credits and paper money circulating in every country of the globe is reacting very materially on the present and prospective supply of gold, and it would seem timely to briefly review its relative influence on prices in general, which in normal times zig-zag to meet the demand for and the supply of credit and gold. If, for instance, prices and wages are increased, so far as they are paid in gold, it will require a proportionate amount of money to meet the higher costs. It follows as a matter of course that a larger circulation of money is required to meet the demand. While the quantity of gold available as money is seen to exert an influence in the direction of raising or lowering prices, it would seem equally certain that as international commerce progresses, and the system of credit expands, an increased world's supply of gold is a matter of vital importance.

It is true that, in practice, many transactions of buying and selling are set off one against another, but there can never be a system of finance carried on in any country, operating under a gold standard, without a basis of money somewhere.

High Prices Likely To Continue

The tendency to a further rise in prices is likely to continue for several years; the increase in the cost of living, and the importance of adjusting wages to prices; the increasing obligations of nations extending over long periods; the problem of a universal standard of value; the development of commerce and banking; the growth of population and wealth—these are questions which are becoming of increasing importance. With the falling off in the production of gold and a material rise in gold prices, a very serious state of affairs is presented, which is likely to affect the international economic position of all peoples.

We are at the dawn of a bigger financial and commercial tomorrow, and while the situation is fraught with a great many difficulties, we must face conditions as they exist and through frank and free discussion arrive at a practical and sound solution. Let us hope that our united efforts will crystallize into a practical plan for the alleviation of the present critical situation, and that in the process of correction we may establish those principles which lie at the base of national progress and human welfare.

Baffles Should Be Tight*

By W. F. Schaphorst

One subject that is seldom touched upon in connection with boiler operation is the baffle wall. A baffle seems to be a simple part of a boiler setting, and therefore worthy of little thought, but that is not the case. Baffles should be correctly designed, correctly placed in the boiler tubes, and they should be leakless. Tests have proved that they cannot be placed haphazard, here and there. The volume of the hottest gases usually determines the position of the first baffle encountered. Then, as the gases reduce in volume, due to coming in contact with the tubes and giving off heat, it is clear that the second baffle must be so placed that there will be no reduction in gas velocity. And so on. As the gas moves from pass to pass the baffles are placed closer and closer together.

If the baffles leak because of loose or careless construction, the hot gases will "short-cut" through the baffle and escape up the chimney without giving off the full amount of heat. The chimney gases will be too hot. Holes in baffles should be stopped up with plastic fire brick. Or, when the baffle is in a badly damaged condition, it might be well to replace the entire baffle with a new leakless monolithic baffle of this plastic composition.

Determining the Amount of Dust in the Air of Miami Copper Mines

The U. S. Bureau of Mines, in co-operation with the U. S. Public Health Service, has begun a study of dusts from the Miami, Arizona, copper mines, according to the *Journal of the Franklin Institute.* To determine the dust content a volume of 19 cu.ft. of mine air is filtered through a glass tube containing 100 gm. of sugar, the tube being of such dimensions as to give a filtering column 1¾ in. high. The sugar is then dissolved in water and the recovered dust screened through a 280-mesh screen, which removes all particles larger than 50 microns in diameter. These are rejected, as particles of wet dust larger than 10 microns in diameter are considered harmless, as they do not lodge in the lungs. The dust is then graded into two portions, a non-injurious, consisting of particles between 12 and 50 microns in diameter, and an injurious, made up of particles smaller than 10 microns. The total dust is determined in milligrams per cubic meter of air, the number of particles per cubic meter, the number of injurious particles per cubic meter, their weight in milligrams per cubic meter, and the weight of the dust over 10 microms diameter in milligrams per cubic meter. Photomicrographs are made of characteristic dusts.

Manganese Production Is Decreasing, according to the U. S. Geological Survey. Reports sent by operators of manganese mines to the Survey covering the first three months of 1919 show that the shipments of manganese ore during that quarter were much smaller than during any other quarter since 1917. The shipments of high-grade ore were 23,937 tons, against 75,465 tons during the last quarter of 1918 and 305,869 tons during the entire year. The number of shippers was only 24, against 247 during the year 1918. The shipments of low-grade ore, containing 10 to 35 per cent manganese, were 35,516 tons, against 320,455 tons during the last quarter of 1918 and 916,163 tons during the year.

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PETROLEUM SECTION

Engineering Notes and Equipment Details
Production Statistics---Progress
in Important Fields

Mexican Senate Introduces New Oil Bill

Legislation Providing for Nationalization of Oil Lands Results in Sharp Conflict—Foreign Oil Companies Appeal to Supreme Court

ACCORDING to reports reaching New York from Mexico, the inactivity of the Chamber of Deputies, which has failed to take action on the nationalization of oil lands, has resulted in the Senate initiating new measures based on those of the President, but differing therefrom in that the retroactive feature is absent. Therefore, if these measures are enacted into law, the oil lands to which title was obtained before the present Constitution became operative, on May 21, 1917, would not be affected.

President Carranza's decrees, which were for the purpose of making Article 27 of the Mexican Constitution apply to foreign-owned oil lands, have been the subject of bitter attack by the foreign interests, which declare that the decrees as well as the article are confiscatory.

In the course of the debate, efforts were made to include in the measure a complete redrafting of the Article 27, which caused considerable discussion. The government's side, supporting the nationalization program, was presented by Luis Cabrera, Secretary of the Treasury, and Leon Salinas, Secretary of Industry and Commerce. Secretary Cabrera has been quoted to the effect that the foreign oil interests would not be satisfied with the decision of the Senate, and therefore it was only a waste of time to discuss the oil question.

The suits brought in the Mexican courts by the foreign oil companies have been appealed to the Supreme Court. Apparently, to delay any action of this court, Secretary Cabrera has opposed the action in order that the Executive Department of the Mexican government and the oil interests may reach an understanding. So far, no information is available as regards an understanding between the respective parties in interest.

Investigation of Oil Resources in Utah

Geologists of the U. S. Geological Survey are in the southern part of Utah, according to a report of Director George Otis Smith, to Congressman Meton H. Welling, making a reconnaissance investigation of the possibilities of finding oil in the Virgin River section. After making an examination of the geological conditions, Messrs. Reeside and Bassler, who have the work in charge, will move eastward and northward, extending the scope of the work as their judgment concludes that conditions warrant.

The proposed survey of a large area including much of the San Rafael Swell has been deferred through lack of funds. It has also been found necessary to eliminate field work on oil shales in Utah, although a general report on the oil shales of northeastern Colorado and southwestern Wyoming is approaching completion.

In view of the threatened oil shortage, companies are prospecting for oil in portions of New Mexico and Arizona, and, in the judgment of the Federal geologists, Utah has better prospects than many other areas in which no commercial production of petroleum has yet been assured.

The study of the geology and ore deposits of the Cottonwood and American Fork districts—interrupted during the war—has been resumed. It is expected that the field examination will be completed this fall, and that Messrs. Calkin and Butler will submit their report before the field session of 1920. A similar report on the geology and deposits of the Oquirrh Range, that had been recommended and planned, was abandoned because of lack of funds. The general report by Mr. Butler on the ore deposits of Utah is now in preparation for publication.

World Petroleum Investigation

According to reports from Washington, an investigation of world petroleum conditions has been initiated by the Administration, particularly with regard to discrimination that may be exercised against American enterprise obtaining control of foreign properties. It is understood that this move was instigated by the Shipping Board and also through suggestion from Congress.

The remarkable statements made by Senator Phelan, of California, in a discussion in the Senate, to the effect that foreign capital was given free rein in the exploitation of oil land in the United States, whereas, with the exception of Mexico, Americans are almost entirely excluded from all foreign fields, lent an impetus to such an investigation. Realization of this condition is reported to have caused the Shipping Board to urge President Wilson to undertake such an inquiry for the purpose of developing a national policy to assure an adequate fuel-oil supply for the United States Navy and for merchant ships.

The first step, it is understood, has been to obtain reports from consuls in every country where oil is produced, which will cover the mining laws and any legal restrictions imposed on foreigners in obtaining concessions. When all the details have been obtained a complete report will be made, and used as a basis in determining whether domestic measures of exclusion are necessary.

Natural Gas in Elk Hills, Kern County, Cal.*

R. P. McLaughlin, State Oil and Gas Supervisor of California, Describes Recent Activities of His Department in New Oil and Gas District—Further Tests Necessary To Determine the Possibilities of the Field

AN IMPORTANT addition to the available supply of natural gas was the most striking oil-field development during the month of May. It is possible that one of the largest gas fields in California has been tapped by this work in the Elk Hills, in Kern County.

The discovery was made by the Standard Oil Co. at its well No. 5, Sec. 36, T. 30 S., R. 23 E., M. D. B. & M. Through its co-operative attitude, the company afforded the State Mining Bureau an opportunity to demonstrate the economic value of scientific and technical work in the exploitation of natural deposits of oil and gas. The discovery is the outcome of recommendations made by the engineering staff of the Bureau. Successful demonstration of the recommendations could not have taken place had the company not followed the policy of acting upon suggestions which to it at first appeared of doubtful value.

The recent development gives another clear demonstration of the fact that rotary tools may easily and effectually conceal valuable deposits of oil or gas. Such a condition must not be confused with the unsettled question of protection of deposits by mud fluid. An adequate test of the value and productiveness of certain strata requires that water be "shut off," and then the well must be bailed or pumped.

The first investigations and recommendations by the State Mining Bureau in the Elk Hills were made by Deputy Supervisor R. N. Ferguson. His account is as follows:

Prior to the development of oil by the Standard Oil Co. on its "Hay" property, in Section 36, T. 30 S., R. 23 E., M. D. B. & M., in the Elk Hills, the field had been inactive for several years. The only matter coming before the department concerning the field was the waste of gas from the Hillcrest well, on Section 28, T. 30 S., R. 23 E., M. D. B. & M. This waste is reported to have started when the casing was pulled from the well. It was not brought to the attention of the department until the escaping gas took fire early in 1918. At that time it was investigated, and from unofficial sources it was determined that the gas was coming from formations a little over 600 ft. below the surface. No log of the well was or is as yet available. At the time of the receipt of "Notice of Intention to Drill" Hay No. 1 (Sept. 20, 1918), in this field, the department was in possession of the above information relative to Hillcrest Well No. 1 and of logs of the following Associated Oil Co.'s wells:

Section 22, T. 30 S., R. 23 E., M. D. B. & M.—Well No. 3, which reported a 1,000-bbl. flow of hot salt water from 2,690 ft. to 2710 ft. and gas, but no oil. Well No. 4, N.E. ¼, which reported showings of gas from 610 to 628 ft., but no oil. Well No. 4, S.E. ¼, which reported a depth of 1,185 ft., but no oil, gas or water.

Section 24, T. 30 S., R. 23 E., M. D. B. & M.—Well No. 2, which reported a depth of 1,291 ft., but no gas, oil or water. Well No. 3, which reported gas at 2,415 ft., showing of oil at 2,500 ft., gas between 2,800 and 2,900 ft. Well No. 4, which reported a depth of 1,187 ft., but no gas, oil or water.

Section 26, T. 30 S., R. 23 E., M. D. B. & M.—Well No. 1, which reported gas at 1,090 ft., oil of 35 degree gravity from 3,067 to 3,140 ft., heavy oil at 3,580 ft., and oil and gas at various points between depths of 3,724 and 4,030 ft.

Section 30, T. 30 S., R. 24 E., M. D. B. & M.—Well No. 1, which reported gas between depths of 410 and 520 ft., and oil and gas from 2,470 ft. to 3,058 ft. Logs of several other wells, less than 500 ft. in depth, were also available.

From this information, and a general knowledge of the structure of the region, it was assumed that the following series of formation existed throughout the Elk Hills. This assumption was arrived at by roughly contouring the exposed formations as shown by geological maps, and comparing the well logs, using a correlation line based on the contour map:

First—500 to 1,000 ft. of formation likely to carry upper water.

Second—At least 1,000 ft. of formation likely to carry gas in commercial quantities. The upper portion of this gas zone to correspond stratigraphically with that found in Hillcrest well. Section 28, T. 30 S., R. 23 E., M. D. B. & M., and in Associated Well No. 4, N.E. ¼, Section 22, T. 30 S., R. 23 E., M. D. B. & M., and Well No. 1, Section 26, T. 30 S., R. 23 E., M. D. B. & M., and Well No. 1, Section 30, T. 30 S., R. 24 E., M. D. B. & M.

Third—Either (A) or (B):

(A) The above gas zone to continue to a thickness of 2,000 ft., and to be underlain by the flowing salt water reported in the log of the Associated Oil Co.'s Well No. 3, Section 22, T. 30 S., R. 23 E., M. D. B. & M., at 2,690 ft., and this in turn to be underlain by a productive oil zone.

(B) The gas zone to give way to an upper oil zone, the two to have a thickness of about 2,400 ft., and to be underlain by the hot flowing salt water, and this in turn to be underlain by a second oil zone.

In starting Well No. 1, the company essayed "to drill until we encounter a productive oil or gas formation and then cement a string of casing above such formation, the size and weight of casing used to depend on the depth at which we encounter productive oil or gas." The reply to the proposal was so written as to specify a manner of drilling which would properly protect the gas and oil from damage in either of the above cases. It was recommended:

First—That conductor pipe be securely cemented in the first blue clay below the yellow surface gravels (not deeper than 500 ft.). This casing was specified to serve the double purpose of excluding possible upper water and of making it possible to hold pressure on the mud, with which underlying gas formations were to be sealed.

Second—It was recommended that in drilling ahead the size of the hole be reduced at a depth of 1,500 ft., so that, after determining the full thickness of the gas zone, the hole could later be reamed to a point below the gas, leaving a shoulder at that point. It was expected that this shoulder would be used as a landing point for the casing with which the gas was to be cased off. It was thought that one of two things would develop during this drilling to determine the point of landing: (a) Water sand would be encountered; and in this case it was expected that the company would be required to cement casing above the water and below the gas; or (b) oil would be encountered below the gas, in which case the company would desire to case off the gas before trying to produce the oil.

Third—The recommendation was so worded that in case water was encountered above the productive oil, or in case the company desired to drill to the deeper zone (below the water), a string of casing should be cemented below this water in such a manner that no oil- or gas-bearing formations would be cased off with the water behind this casing.

Well No. 1 was drilled to a depth of 2,532 ft., and produced oil in January, 1919. Neither the company proposal nor the department recommendations, as set forth in the letter quoted, were followed by the company. Eighteen-inch stovepipe casing was cemented at 495 ft. and 12½-in. casing at 2,480 ft. No test was made to determine the value of the upper gas zone. It was, therefore, necessary to devise plans which would not unduly hinder the company in its search for oil, but would still insure that valuable gas deposits were not being overlooked, with the attendant possibility of waste. This part of the work was carried on by Deputy supervisor R. D. Bush and the State Oil and Gas Supervisor.

Proposal to drill wells Nos. 2 and 3 followed soon after the demonstration that No. 1 was a satisfactory producer of oil. The proposals were that the wells should be drilled in about the same manner as No. 1 had been drilled; that is, in a manner which would not permit test for supposed upper gas. The Bureau was reluctant to see a further precedent established of passing through

*Excerpt from advance chapter of Fourth Annual Report of the State Oil and Gas Supervisor, California State Mining Bureau, May, 1919.

the upper gas zones without testing their value and, if necessary, providing against waste by dissipation or flooding. The company, on the other hand, maintained that a single oil well in this locality did not adequately prove the value of the property and that its proposals should be followed. It was decided that wells Nos. 2 and 3 should be drilled approximately as proposed, with the added proviso that special attention should be given, during drilling operations, to observing gas indications in the upper formations. It was further agreed that, should these two wells fail to prove definitely the existence or non-existence of upper gas zones, another well would be drilled for that specific purpose. The company acceded to the proposed expenditure, notwithstanding its expressed doubt as to the commercial value of the gas zones. The test well was designated as No. 5.

In Well No. 2, at a depth of 1,537 ft., the driller in charge reported that mud in the circulating ditch showed considerable gas for about two hours. Owing to misunderstanding as to what was required in observing or testing this gas showing, the well was not "shut down" until it reached a depth of 1,630 ft. At the last-mentioned depth an inspection showed no evidence of gas. It was later reported that some gas was noted at a depth of 1,835 ft.

During the drilling of Well No. 3 a showing of gas was reported at a depth of 1,652 ft., and inspection showed only a few bubbles in the circulating mud. At a depth of 1,850 ft., gas was again reported, and inspection was made by a representative of the Bureau. Heavy mud was circulating, and where it discharged into the ditch the odor of gas was noticable. The gas bubbles confined in the mud broke upon rising to its surface, and gave the appearance of boiling. Such an appearance extended throughout the length of the ditch and into the suction tank. The drilling foreman stated that he had seen much weaker showings at wells which had later developed into good gas producers. The showing also appeared to him similar to those observed at wells Nos. 1 and 2 at depths of 1,825 ft. and 1,865 ft., respectively.

Drilling continued, and 12-½ in. casing was cemented at a depth of 2,455 ft. Gas flowed from the well at the rate of over two million cubic feet per day through a two-inch "bean" under pressure of 26 lb. per square inch, when the well was open to a depth of 2,465 ft. The well was completed as an oil producer at a depth of 2,683 ft.

Notice of intention to drill Well No. 5 was filed on Mar, 28, 1919, proposing to cement 12½-in. 50-lb. casing at a depth of 1,800 ft., drill to 2,000 ft., and test out gas. The casing was cemented as proposed, and it is of particular interest to note that at the test of shut-off, on May 24 and 25, with five feet of open hole below the casing shoe, the well was bailed to a depth of 1,300 ft. and stood twenty-five hours with a rise of only five feet in the fluid level. This feature is of particular importance, as indicating that there is but slight danger of a well in the vicinity blowing out prematurely, although Well No. 4 did blow out from a deeper zone. Drilling continued, and 6⅝-in. casing, with 100 ft. of perforated pipe on the bottom, was landed at 1,895 ft. and the well bailed. Gas began to flow uncontrolled on May 28, at the rate of thirty-three million cubic feet per day. The flow was later placed under control, and, so far as pipe-line facilities permit, is being delivered to consumers

Well No. 4 was begun about the same time as No. 5, and was drilled in similar manner to wells Nos. 1, 2 and 3. It therefore does not necessarily appear in the chronological statement of events previously set forth. It is of interest to state that it encountered a large flow of gas lower than that in No. 5. The gas ignited, burned the rig, and at the time of writing the fire can be seen for many miles.

From the foregoing description it will be noted that the extent of gas resources of the Elk Hills has not yet been thoroughly tested. The necessity for a careful drilling program, insuring adequate protection, is self-evident.

August Production of California Oil Fields

August production of the California oil fields is given by the *Standard Oil Bulletin* in the following table:

CALIFORNIA OIL PRODUCTION FOR AUGUST

Field	New Rigs	Wells — Drilling	Wells — Completed During Month	Wells — Abandoned During Month	Wells — Producing	Production per Day, Bbl.
Kern River	14	19	9	..	2,017	20,700
McKittrick	2	3	..	..	346	7,236
Midway-Sunset	16	83	18	2	2,301	86,516
Lost Hills-Belridge	3	19	5	1	552	12,247
Coalinga	5	38	7	3	1,197	44,715
Lompoc and Santa Maria	6	21	..	..	369	15,265
Ventura County and Newhall	10	37	4	..	503	4,871
Los Angeles and Salt Lake	..	3	..	..	666	3,887
Whittier-Fullerton	22	121	8	..	850	83,090
Summerland	..	..	..	..	142	147
Watsonville	..	..	..	..	5	75
Totals	78	344	51	6	8,948	278,749

Total crude-oil stocks, Aug. 31, 1919, were 33,705.383 bbl. Total shipments from fields in August, 1919, 8,786,695 bbl.

The British-Mexican Petroleum Co.

Final arrangements are now being completed for the factors entering into such a change are the high the establishment of a working basis of a new oil company to be known as the British-Mexican Petroleum Co., Ltd., which will control the products of the Pan-American Petroleum & Transport Co. and its subsidiaries. Negotiations with this end in view were started in 1915, but were not concluded at that time, because of war conditions.

It is the intention of the new company, it is understood, to gradually replace coal-driven by oil-driven liners, and to build storage oil tanks in various parts of the world. The new organization has already agreed to purchase from the Mexican Petroleum Co., Ltd., a minimum quantity of 7,00,000 bbl. of oil annually for a period of years.

Herbert G. Wylie will be the active manager of the new company, with offices in London, according to information obtained at the Washington office of the Mexican Petroleum Co.

The British-Mexican Petroleum Co. is capitalized at $9,733,000, equally divided between British and American interests. It is reported that Sir Thomas Royden, deputy chairman of the Cunard Steamship Co., is a director of the new company, which fact, it is believed, indicates that British steamship companies are probably taking definite steps to adopt oil as fuel instead of coal. Reports coming from England to the Bureau of Foreign and Domestic Commerce point out that two of the factors entering into such a change are the high price of coal and the ease and rapidity with which a vessel can be "oiled."

CORRESPONDENCE AND DISCUSSION

Letters From the Mining and Metallurgical Industry Dealing With Pertinent Subjects of Interest

Early Developments in Flotation at the Kyloe Copper Mine, New South Wales

The Journal for July 5 contains a paragraph, on p. 21, concerning an improvement in flotation practice at Anaconda,[1] which is interesting to me because the improvement mentioned therein is one of several that were made at the Kyloe Copper Mine, New South Wales, Australia, in 1910, in an M. S. machine, adapted from the existing zinc-lead practice at Broken Hill.

The Kyloe plant is worthy of mention, as it was the first plant to make a commercial success of the froth-flotation of copper ores, and the one in which most of the present-day commonly accepted principles of copper froth-flotation were firmly established. Among them were: (1) the feasibility of using a cold non-acid circuit; (2) the practicability of treating ores containing a small amount of sulphide minerals (only 6 per cent instead of the 30 per cent or more contained in Broken Hill ores); (3) the production of high-grade concentrate by refloating low-grade froth; (4) the necessity for grinding finer than in zinc-lead practice where dense hot acid solutions were the order of the day; and (5) the importance of low and fairly constant pulp dilution in the machine. In fact, feeding reagents at the grinding plant instead of at the head of the flotation machine was the only important principle of present-day practice which was not developed at this plant.

Later, on the advice of A. R. Weigall, the consulting engineer, the Kyloe system of copper flotation was adopted by the Seoul Mining Co. at its Suan plant in Korea, to treat tailings from the gold mill, containing as little as 2 per cent of sulphides, mostly in the form of chalcopyrite. The results were satisfactory until ore was encountered containing secondary bornite, which proved to be difficult to recover. The problem was investigated and solved, quite independently of the excellent work done in America about the same time by G. A. Chapman, by feeding a collecting oil to the tube mills.

At the Suan plant, not only are all middlings returned to the head of the machine by the suction of the stirrer in the first mixing box, but also the transference of the rougher concentrate to the cleaner cell is accomplished in the same manner.

By properly adjusting the mixing box and the stirrer a head of 5 ft. can be negotiated without difficulty, and there is no necessity for pumps or elevators around the plant, except in the case where the cleaner tailing is returned to the regrinding circuit instead of directly back to the head of the rougher.

H. Hardy Smith,

Huchang Mining Co., Kokai, Heianhokudo, Chosen, Aug. 20, 1919.

[1]The feature at Anaconda to which Mr. Smith refers is the return of middling to a box in front of and slightly below the first M. S. cell, the middling pulp being drawn up into this cell by the suction created by the impeller.—Editor.]

Foreign Trade and Government Protection

Although I am interested in an entirely different line from that of the manufacturers, would it be possible that a few remarks on foreign conditions might be of interest to them? One of the questions now confronting us as a nation is that of foreign trade. Our Government seems to be intensely interested in the building up of a merchant marine to further this trade, to be offering all sorts of advice, largely through the Department of Commerce, and to be urging the industries of the country to expand, particularly in Latin America.

Beautiful, is it not?

Take the case of one American who has seen considerable foreign experience. Our Government suggests "Go after the business and bring the money home." But if you get into any trouble outside of our boundaries, it also says, "Why did you leave the United States? You had no business out of the country, and as you went to further your own interests, you cannot expect any consideration from this Government, and you will have to stand your losses." (This may mean your life as well as your property.) "Bring home the money, but don't ask us to do anything for you except to receive your Income Tax."

What real American in Latin America does not send orders home for home-made goods? How many Americans in Latin America are not like the Chinese in this country, striving to make their pile and then get back home? And what a time some of us have had to get back, particularly if we left before passports were required?

Our Consular Service is 99 per cent inefficient. If you doubt this, go abroad and see some of our "representatives;" or, worse yet, try to get one to fulfill his obligations to you as an American citizen, and see what results you can obtain.

This is a part of my own personal experience:

After having been ordered out of Mexico by a paternal State Department, which stated that I had no business to be out of the States, and had no recourse to the department for losses incurred in a foreign country, I took another chance, and went to Australia. Armed with letters to both the Consul and the Vice-Consul (two out of three good men I have encountered in the service), I immediately became identified as an American. After the war broke out, I desired to return to the States, and I applied for

passports for myself and family to the successors of the men to whom I had taken letters, one of which, by the way, was from a former Consul to South Africa, the third good man in the service.

Would the Consular Department look up my letters? "No. They were filed in the basement and were unavailable." I would "have to secure a birth certificate. American citizens in Sydney cannot identify you unless they were present at the time you were born."

I was therefore compelled to write to the Mayor of Canton, Ohio, which place I had left thirty years before, requiring a loss of three and a half months' time waiting for a reply, and upon the receipt of the necessary papers, duly certified by the Mayor and with a certificate from the State Board of Elections stating that he was the duly elected and qualified Mayor, was met by the true statement of the Consul, "You were never the Mayor of Canton."

Ye Gods! and ten thousand miles from home!

After getting photographs, and duly presenting my wife for identification, the next brilliant remark was, "Who is this woman?"

I got the passports, and the Consul got my personal opinion of his ancestry and his intellectual rating.

Now, after having been ordered out of Mexico by our State Department, and after having had such a hard time to get home from Australia, my advice would be to stay at home, all ye Americans. Let the foreigners come here to buy your goods, or hire an Englishman, a Frenchman, or even a German as a traveling man or agent to represent your firm and thereby avoid having a widow and perhaps some orphans on your hands should your agent be killed, for if you don't provide for her after her husband has been robbed and murdered, she will have to provide for herself.

The season is open for Americans the year round, and though our Government may protect—yes, does protect ducks and geese—it does not protect its citizens.

Some of us remember the Mafia. We many of us remember the Maine. We settled. We were settled with. How about the Cumbre Tunnel, Santa Ysabel, and even on our own territory, Columbus?

By all manner of means, get the trade. When you send out an agent, if he be an American, better send a death certificate and a coffin along, so as not to bother our Consular Service or our State Department with any such trifling matters as a murdered citizen.

G. L. Ashmun.

Bowling Green, Ky., Sept. 22, 1919.

Herbert Hoover's New York Address

The issue of the Journal of Sept. 27 is the most valuable publication that has ever come into my office, in that it contains the address in full of Herbert C. Hoover to the American Institute of Mining and Metallurgical Engineers. In common, I imagine, with the whole body of American engineers, I have been waiting for the calm, clear, dispassionate and dependable statement of the only living man today who can define and set forth existing world issues from accurate personal knowledge.

Through all the mass of conflicting, political, and otherwise biased statements which have issued from time to time through the medium of the press since the war ended, none have previously seemed to bear the impress of absolute sincerity or of even scant knowledge of facts, saving only the public speeches of the President himself, which speeches, unfortunately, only a few people comparatively have personally heard or have read through the limited press reports.

I have read and studied Mr. Hoover's statement until I almost know it by heart. It is the masterly statement of America's greatest living engineer today, the only man who is capable of speaking with authority, from absolute and exhaustive personal knowledge, without bias, of the vital issues confronting this nation. As such it should receive world-wide publicity. It may well be studied in the public schools, because the issues involved are, and will be perforce, largely the heritage of the men and women of tomorrow.

Education, in these matters plainly differentiated, are clearly and forcefully separated from the biased statements and interested attitude of political influences, seeking to make these issues party capital, one way or another, is an absolute requisite for correct final judgment and action, which judgment and action will be continuously needed at least over the next decade and possibly longer. Yet, so far as I have observed, Mr. Hoover's masterly and official statement is not receiving any part of the publicity which it imperatively demands, and I am hopeful that in your wisdom and judgment, you may find it advisable and possible to issue this speech in pamphlet form for general distribution. I am convinced that American engineers at least will warmly welcome such a publication (which manifestly should be made by the United States Government itself), in the event it is not to be so officially published, which I surmise might be politically an impossibility.

Geo. H. Clark,
Consulting Engineer,
Member Yale Engineering Association.

Birmingham, Ala., Oct. 10, 1919.

The Diesel Engine in the Southwest

Referring to my article which appeared in your issue of Sept. 20, entitled "The Diesel Engine in the Southwest," please refer to a description of a compressor in connection with the Diesel engine where I made use of the expression "feather valve" in describing the valves of this compressor. I now learn that the word "Feather," in connection with a valve, is a registered trade name which was in this case misused, as the valves referred to in my article are of an entirely different construction than those to which the above mentioned trade name refers.

B. V. E. Nordberg.

Milwaukee, Wis., Oct. 20, 1919.

NEWS FROM WASHINGTON

By PAUL WOOTON
Special Correspondent

Magnesite Tariff Bill

By vote of 154 to 112 the House of Representatives on Oct. 7 passed the magnesite tariff bill (H. R. 5218). As passed, the bill provides a duty of ½c per lb. on magnesite ore; ¾c per lb. on calcined, dead-burned and grain magnesite; and ¾c per lb. and 10 per cent ad valorem on magnesite brick. The bill as originally introduced provided ¾c per lb. on ore; 1¼c on calcined, dead-burned and grain magnesite, and 25 per cent ad valorem on magnesite brick.

A sharp difference of opinion as to the duty which should be imposed on imported magnesite developed during the discussion of the bill. Representative Moore of Pennsylvania, one of the high-protection leaders of the House, opposed the rates as too high and suggested their amendment. Mr. Moore insisted that a duty of ½c a lb. is the very highest rate which should be allowed on calcined, dead-burned and grain magnesite. Mr. Moore's contention was largely in the interest of American investors who, he said, prior to the knowledge that any important deposits of magnesite existed in this country, developed mines in Austria representing an investment of $2,000,000 of American money, and in addition, invested a half million more in plants for the treatment of the imported ore, after its arrival here. Mr. Moore pointed out that no tariff duty would be needed so far as Western magnesite is concerned, if it were manufactured in the West, instead of in the East. As a result, under the proposed tariff, only one series of mines in one state would have to furnish the product for states three thousand miles away, who would be obliged to pay excessive freight charges and would be prohibited from getting their raw material in competition. Representative Hadley of Washington, who has been most prominent in urging the tariff on magnesite, in an extended speech pointed out that our deposits of magnesite are very extensive, there being 8,000,000 tons blocked out and in sight, according to the Geological Survey. He said that he had evidence from consumers that domestic magnesite is superior to the Austrian product, and that magnesite mining here has reached the point where all the requirements of the country can be filled. In connection with the claim that the bills would play into the hands of an American monopoly, Mr. Hadley pointed out that this was not true, inasmuch as the largest producer owns only one-eighth of the total known deposits in the country, and has never produced more than one-third of the country's output. He referred to the Geological Survey's report showing that magnesite was produced in ten counties in California in 1918, and that in 1917 there were 65 separate producing companies in that state.

Mr. Hadley reviewed the situation which confronted the steel industry of the United States when war was declared on Austria, and argued against allowing the country to drift back into the same position. Mr. Hadley had figures purporting to show that $2,000,000 has been invested in the magnesite industry in the State of Washington and $1,500,000 in California, which were contested by Representative Moore, who called attention to some estimates that such investments in the West do not exceed $500,000.

It is evident, from the discussion on the rate of pay in Austrian mines, that no reliable information is at hand as to the wage rate there.

Figures submitted to the Ways and Means Committee show that the price of magnesite at Eastern ports, under the operation of the proposed tariff, would be $50 a ton as compared with the pre-war price of $16 laid down at Eastern ports. The freight rates from the State of Washington to Eastern points is $16 a ton.

Representative Kitchin, the ranking democratic member of the Committee on Ways and Means, attempted to amend the bill by proposing lower rates of duty in each case, but each of his amendments was defeated.

The sensation of the debate, however, came when Mr. Kitchin proposed to add the following provision to the bill: "That the duties provided for shall not apply unless it be shown to the satisfaction of the Secretary of the Treasury that the industry producing magnesite is paying for the labor, in the production of such magnesite, as much as $12.50 a ton." After a long parliamentary wrangle, the proviso went out on a point of order. Mr. Kitchin forced a record vote which, with one exception, was along party lines.

The main arguments for the rates of duty as carried by the bill were that the tariff would add only 3¾c a ton to the price of finished steel, and that it is necessary to maintain the war-born magnesite industry which produced 316,000 tons of magnesite in 1917 despite the non-existence of the industry prior to the war.

Civil Service Positions Open

The U. S. Civil Service Commission announces open competitive examinations for the following: Chief metallurgical chemist (male), $3,000 per year; assistant chief metallurgical chemist (male), $8.80 per day; metallurgical chemist (male and female), $6.88 per day; assistant metallurgical chemist (male and female), $5.12 per day. Applications must be filed with the commission on or before Nov. 25, 1919.

Also a position as transitman for men only at $900 to $1,200 a year, or at higher or lower entrance sal-

aries, depending upon the qualifications and duties of the appointee, who may be allowed the temporary increase of $20 per month allowed by Congress. Applications will be received until further notice.

Applicants should apply for Form 1312 to the Civil Service Commission, Washington, D. C., stating the exact title of the examination desired.

Protective Tariff Legislation

A general anti-dumping bill, intended to protect American industry from the unloading of foreign products in American markets pending the passage of new protective tariff legislation, was introduced by Senator Smoot on Oct. 7. It is stated that this bill has the support of the Republican leaders and is designed to take the place of the pending bills for a protective tariff on dyestuffs and other "infant industries."

Canadian Reciprocity Bill

The House of Representatives on Oct. 9 voted to repeal the Canadian Reciprocity Act, without opposition. It was declared that there was no intention to act in hostile fashion toward Canada, but that all nations should be treated equally in such matters. Under the Reciprocity Act a number of products were duty free, including unmanufactured asbestos, gypsum, talc, mica, feldspar and fluorspar.

Iron Imports and Exports*

During August, 1919, there was imported to the United States 32,117 tons of iron ore, 21,991 tons of scrap iron, and 2,902 tons of pig iron; these commodities coming from Spain, Sweden, Canada, and Cuba. Pig-iron exports totaled 38,373 tons during July and 35,764 in August. Iron ore exported was 182,066 tons in July and 44,915 tons in August, the entire amounts going to Canada.

The decrease in the amount of exports during August from those in July may be attributed in part to abnormally high exchange rates now in force, which have advanced the export cost of foreign countries from 15 to 50 per cent.

Some Manganese Producers Are Still Active

The signing of the armistice resulted in a considerable decrease in the activity of manganese producers, but despite present conditions, several properties have been developed during 1919, according to W. R. Crane in a Bureau of Mines bulletin. The Superior Manganese Company reports an exceptionally promising discovery of high-grade ore at Neva, Tenn. A ten-ton electric furnace for treating this and a carbonate ore from the East Fork Mine, near Sevierville, Tenn, is being built by the Tennessee Manganese Co., of Knoxville.

Considerable activity in manganese development work is also reported in the Cuyuna range in Minnesota. Fairly large bodies of manganiferous iron ore have been developed in Eagle County, Col., and the Philipsburg district in Montana is still active.

*Excerpted from "Monthly Reports on Minerals Investigations of the Bureau of Mines," September, 1919.

American Mining Congress to Meet at St. Louis

Annual Convention To Be Held in November Will Consider Important Readjustment Problems—Nation-Wide Participation Desired

FOLLOWING close upon the Industrial Conference recently held in Washington, another event of national importance is approaching in the annual convention of the American Mining Congress, that is to be held at the Planter's Hotel, in St. Louis, Mo., Nov. 17-21. At this convention the officers of the congress hope to bring together all conflicting interests that enter into the nation's business, and by discussion of the various readjustment problems to determine what policies will best serve the country at this critical time.

Participation in the convention, it is announced, will be upon the following basis: The President of the United States may appoint ten delegates at large; governors of states and territories, ten delegates; state mining departments, five; county commissioners, two; mayors of cities, one for each 100,000 population, except that where the population is 100,000 or less two may be appointed; mayors and presidents of towns, two delegates; national bodies organized in behalf of commerce, mining, and oil, ten delegates, and similar state bodies, five. Presidents of state schools of mines or universities where mining is included in the curriculum may be members of the convention. Members of the American Mining Congress are likewise members of the convention. In addition to this representation, members of both houses of Congress have been invited to participate.

The subjects that are upon the general program for discussion include the proposed nationalization of industry, industrial relations, the international petroleum situation as relating to the United States and Mexico, and national "blue-sky" laws. Other subjects are those of public lands and water power, freight rates in relation to industry, and national co-operation among industries. The relation of mining to national finance, and to state and Federal governments, as well as to labor, will also be discussed. Conservation and protection of the wasting industries will be another topic to receive attention.

Problems directly relating to each division of mining will be given full discussion in divisional conferences. Separate meetings will be arranged, for which programs are being prepared, covering such subjects as pertain directly to metal mining, coal mining, petroleum, non-metalliferous substances, gold, silver, and precious metals, and oil shale. As to each of these subjects there will be discussions upon production, transportation, and exchange. The recommendations of each sectional meeting will be referred to the general committee on resolutions for final action by the whole convention.

Appointments of delegates and inquiry regarding convention plans and other matters may be addressed, it is stated, to John T. Burns, assistant secretary of American Mining Congress, Planter's

Hotel, St. Louis, Mo. The annual members' meeting of the congress will be held at the Planter's Hotel on Nov. 20, for the purpose of electing four directors and for transacting other business.

In conjunction with the convention will be a National Exposition of Mines and Mining, a feature of which will be an historical and educational exhibit by the U. S. Bureau of Mines, showing the history, development, and possibilities of mining in the United States. District and state exhibits will also be displayed.

American Mining Congress and the National Exposition of Mines and Mining

Sessions To Be Held in Conjunction With Machinery Exhibit in St. Louis, Nov. 15 — National Gold Conference and Meeting of War-Mineral Producers

THE National Exposition of Mines and Mining, embracing every phase of mining, including coal, metal, chemical, non-metalliferous and petroleum machinery and labor-saving appliances, will be held in the old Southern Hotel Building, St. Louis, Mo., during the week of Nov. 17, in conjunction with the American Mining Congress. The St. Louis Chamber of Commerce, the St. Louis Convention and Publicity Bureau, the Associated Industries of Missouri and the Mining Associations of Illinois and Missouri are co-operating to make the exposition one of the largest exhibits of the industry ever held in the United States. This will be the first time the American Mining Congress has attempted a comprehensive exposition in connection with the educational program of the annual convention.

Applications for exhibit space at the exposition have been received from numerous concerns situated in all parts of the country. The old Southern Hotel Building contains more than 50,000 ft. of floor space available on two floors. There will be no charge for space for actual exhibitors of any of the lines connected with the mining industry.

General sessions of the congress will be held in the Planters' Hotel. The program includes discussions by prominent statesmen and business men on the proposed nationalization of industry, industrial relations, the international petroleum situation as it relates to the United States and Mexico, national "blue-sky" laws, public lands and water power, relation of the mining industry to national finance and to labor, and other topics of interest to the industry.

Problems directly relating to each division of mining will be given full discussion in divisional conferences. Separate meetings will be held, for which programs covering such subjects as pertain to metal mining, coal mining, petroleum, non-metalliferous substances, gold, silver and precious metals and oil shale are being arranged. In the sections there will be discussions upon production, transportation and exchange, and the recommendations of each sectional meeting will be referred to the general committee on resolutions for final action by the whole convention.

The National Gold Conference and National Conference of War-Minerals Producers will also be held during the same week.

A special program in charge of Dr. Harold N. Lawrie, gold economist of the American Mining Congress, is being arranged, but in addition to the selected speakers there will be an open forum for the presentation of all resolutions and practical suggestions which may be offered by those present.

The circular calling upon the representatives of the industry to attend the convention emphasizes the necessity of maintaining an adequate gold reserve and at the same time meeting the demands of the trade, which is apparent to both producers and financiers, but says that the impracticability of changing the present price of gold without overturning the present monetary system and affecting international relations is also apparent. The call states, further:

"The trade demands for gold in the United States during the present year, according to the best obtainable statistics, will exceed the total production of gold in this country by $15,000,000, and next year, if the present ratio of decrease in production and increase in demand is maintained, the trade shortage will be $20,000,000.

"The distress of the producers is reflected in all mining communities, and this unsatisfactory condition pertains not only to the United States but to all other gold-producing sections of the world."

Request for information regarding the appointment of delegates, inquiries regarding convention plans, and similar communications should be addressed to John T. Burns, assistant secretary, American Mining Congress, Planters' Hotel.

New Zinc Oxide Plant at Columbus, Ohio

The American Zinc, Lead & Smelting Co. will build this fall an extensive plant at Columbus, Ohio, for the manufacture of zinc oxide from lead-free ores shipped from the company's mines at Mascot, Tenn. Production will probably begin early in 1920. Zinc oxide is used largely in the rubber and paint industry, and the fact that Columbus is a center of these industries led to the decision to establish the plant there. Besides the mine at Mascot, the company has zinc mines at Joplin and Platteville; zinc smelteries at Hillsboro and East St. Louis, Ill., and Caney, Kan., and a lead smeltery at Granby, Mo.

West African Gold Output

The gold output of Western Africa during the first six months of 1919, and for the corresponding period of 1918 and 1917, according to The Economist, was as follows:

	—Fine ounces—		
	1917	1918	1919
January	31,756	25,407	24,509
February	25,334	25,946	26,068
March	38,126	26,524	26,509
April	29,827	27,682	25,810
May	29,160	29,747	23,748
June	27,517	28,308	25,114

By The Way

Lake County, Col., Wins Boundary Suit

Judge Henry J. Hersey, of the District Court of Denver, recently presided at a suit between Lake and Summit counties, Colorado, which was begun on September 23. The controversy, which was over the boundary line between the two counties, was finally decided in favor of Lake County. The Climax Molybdenum Co., owned by the American Metal Co., happens to be situated approximately on the boundary line in dispute. Lake County, by reason of the decision in its favor, is now entitled to the taxes accruing from this valuable molybdenum property.

Freedom in the Mountain Heights.

The principle of self determination has strong backing in some circles in Telluride. At least one gathers this impression as he reads the interesting columns of the San Miguel Examiner. A recent item reads: "Jack McEchern promised to beat it if he was let out of jail yesterday, so the authorities let him out, and the chances are that he will go." Another item hints that there may be some slight restriction on individual liberty at times when it says, "Kid McGovern drifted back here this week. He is under a six-months jail sentence and upon being told that it was either go back to jail or get out of town for him, he left for the Alta."—Such is life in the mining camps, or is it?

A Great Opal

If opals are unlucky, a certain one that is now being displayed in Washington must be good for a disaster. It weighs 16.95 ounces Troy, and was discovered during the war in a mine in a western state. It has been weighed by the Bureau of the Mint and displayed among other places in the private office of the Secretary of the Interior. The owners of the stone are keeping secret the place of its discovery, but advanced the opinion that the geological formation in which this gem was found occurs in Idaho, Montana and Nevada. The stone was found two years ago but has been kept in a safe deposit vault to await the return of peace and a better market for gems. Although the opal is uncut, the beauty and fire of the stone are striking. It is absolutely free from matrix and its weight expressed into carats is 2,572.

Look Before You Leap

In spite of safety-first precautions and the inculcation of principles that tend to prevent accidents, some individuals seem predestined to casualties of definite types. A group of college sophomores, putting in their first summer of actual underground experience, visited the old iron mines at Mount Hope, N. J. One task was to run a survey line through some irregular stopes from a gloryhole to a shallow hoisting shaft. In their great zeal to display traditional sophomoric erudition some members of the party started in to cover a little extra territory. Investigation disclosed the existence of a winze, whereupon a learned discussion ensued as to the probable history and purpose of the working. Since an upward current of air persisted, it was conceded that there was a communication with some shaft or adit opening at a lower level. The Solomon of the squad offered to prove his contention that it connected with the Taylor mine by going down forthwith and meeting any or all doubters at the entrance to the Taylor. He actually had one foot poised to descend when a pessimist of Scotch ancestry restrained him by force, suggesting that some test be applied to the ladder.

A slight shaking of that relic demonstrated that dry rot may leave but little outward signs of decay, for the ladder at once crumbled to dust and was not. By all the rules of experience, the embryonic engineer had a lesson fit to last a lifetime. Either in spite of it, or through excessive caution, or else due to what a theologian might call the law of foreordination, the same engineer had his bad fall in an old mine shaft about twenty years later. Happily, though, the accident involved nothing worse than the loss of a leg.

Native Labor on the Rand

It is cheering to note that somewhere still on this globe of ours there are those that are proud to work and who by their daily toil gain social distinction. The attention of Mr. Gompers (and, incidentally, Mr. Vardaman, of Mississippi, may be interested) is directed to this Elysium. In darkest Africa these people live, as any paid agitator will tell you. For years, work on the Rand mines has been a tradition with the East Coast native, who obtains in the mines wages and conditions of employment far superior to those in his own country. A member of the Witwatersrand Native Labor Association, in testifying recently before a government commission, according to the correspondent of the Financial Times (London), said that the native is eager to come to the Rand, and the young native who has not worked on the Rand is rather looked down upon. It was, therefore, unnecessary for the association to do much toward actually inducing natives to come and work, and it rather concentrated its energies on transit facilities and good conditions of employment.

Details were given of the recruiting system by the member. Normally the association obtains 40,000 to 45,000 recruits yearly from East Coast territories, and the number employed in gold and coal mines was about 78,750. As only about 170,000 are available for work outside the territories, and the period of work is intermittent, about half the native's time being on the Rand and half at his kraal, there is little scope for appreciable increase in number of recruits. The Portuguese African, who usually works underground, constitutes 38 per cent of the underground native strength, thus forming the backbone of the industry's native labor force.

NEW PUBLICATIONS

Salt Resources of the United States. By W. C. Phalen. Paper, 6 x 9; pp. 284, illus. Bull. 669, U. S. Geological Survey, Washington, D. C., 1919.

Bibliography of Petroleum and Allied Substances in 1916. By E. H. Burroughs. Paper, 6 x 9; pp. 159. Bull. 165, Bureau of Mines, Washington, D. C., 1919.

The Anvik-Andreafski Region of Alaska (including the Marshall District). By George L. Harrington. Paper, 6 x 9; pp. 70, illus. Bull. 683, U. S. Geological Survey, Washington, D. C., 1918.

Recent Developments in the Absorption Process for Recovering Gasolene From Natural Gas. By W. P. Dykema. Paper, 6 x 9; pp. 90, illus. Bull. 176, Bureau of Mines, Washington, D. C., 1919.

Ground Water in the San Jacinto and Temecula Basins, California. By Gerald A. Waring. Paper, 6 x 9; pp. 113, illus. Water Supply Paper No. 429, U. S. Geological Survey, Washington, D. C., 1919.

Pulverized Coal Systems in America. By Leonard C. Harvey. Paper, 7 x 10; pp. 65, illus. Special Report No. 1. Fuel Research Board, Department of Scientific and Industrial Research, London, England, 1919.

Report on Mining Operations in the Province of Quebec during the Year 1918. Paper, 6½ x 9½; pp. 158, illus. Department of Colonization, Mines, and Fisheries, Bureau of Mines, Quebec, Canada, 1919.

A Bibliography on the Roasting, Smelting, and Electrometallurgy of Zinc. Revised to June, 1919. Paper, 6 x 9; pp. 386, illus. Bulletin, School of Mines and Metallurgy, University of Missouri, Rolla, Mo., 1918.

Petroleum in 1917. By John D. Northrup. Advance chapter, "Mineral Resources of the United States, 1917"—Part II. (Pages 683-901). Paper, 6 x 9; pp. 219, illus. U. S. Geological Survey, Washington, D. C., 1919.

The Silurian Geology and Faunas of Ontario Peninsula and Manitoulin and Adjacent Islands. By M. Y. Williams. Paper, 6½ x 9½; pp. 195, illus. Memoir 111, No. 91, Geological Series, Ottawa, Canada, 1919.

Mineral Resources of the United States, 1916. Part II—Non-metals. E. F. Burchard and G. F. Loughlin, Geologists in charge. Cloth, 6 x 9; pp. 1105, illus. U. S. Geological Survey, Washington, D. C., 1919.

Electrolysis in Concrete. By E. B. Rosa, Burton McCollum, and O. S. Peters. Technologic Papers of the Bureau of Standards, No. 18. Second edition. Paper, 7 x 10; pp. 142, illus. Department of Commerce, Washington, D. C., 1919.

A Bibliography of Indian Geology and Physical Geography, with an Annotated Index of Minerals of Economic Value. Compiled by T. H. D. La Touche. Paper, 7 x 10; pp. 571. Geological Survey of India, Calcutta, India, 1917.

The Oil Fields of Allen County, Kentucky, with Notes on the Oil Geology of Adjoining Counties. By Eugene Wesley Shaw and Kirtley F. Mather. Paper, 6 x 9; pp. 126, illus. Bull. 688, U. S. Geological Survey, Washington, D. C., 1919.

Upper Cretaceous Floras of the Eastern Gulf Region in Tennessee, Mississippi, Alabama and Georgia. By Edward Wilber Berry. Paper, 9 x 12; pp. 177, illus. Professional Paper 112. U. S. Geological Survey, Washington, D. C., 1919.

Among Industrial Workers. A handbook for Young Men's Christian Associations in Industrial Fields. Revised Edition. Paper, 6 x 9; pp. 154, illus. International Committee, Young Men's Christian Associations, New York, 1919.

A Bibliography on the Roasting, Leaching, Smelting, and Electrometallurgy of Zinc. Revised to June, 1919. Compiled by Harold L. Wheeler. Paper, 6 x 9; pp. 388, illus. Vol. IV, No. 3, Bulletin, School of Mines and Metallurgy, University of Missouri, Rolla, Mo., 1918.

Contributions to Economic Geology (Short Papers and Preliminary Reports) 1918. Part II—Mineral Fuels. David White, G. H. Ashley, and M. R. Campbell, Geologists in charge. Paper, 6 x 9; pp. 355, illus. Bulletin 691, U. S. Geological Survey, Washington, D. C., 1919.

Western Canada Mining Directory and Year Book, 1919. Cloth, 6 x 9; pp. 114. Progress Publishing Co., Ltd., Vancouver, B. C., 1919.

This book is divided in sections as follows: Directory of Officials of the Canadian Department of Mines, etc.; Directory of Mines in British Columbia, Alberta (coal), Saskatchewan (coal), and Yukon, arranged alphabetically, giving names of owners, locations, etc.; Laws Affecting Mining in Western Canada; Statistics of Dividends and Stock Market; Statistics of Production; List of Mining Publications and Bibliography; Directory of Machinery and Mine-Supply Houses. The value of a directory is determined only by use; therefore, it is too early to say anything about the merits of this one, except that it appears to be well arranged, and is probably a valuable addition to the published information on western Canada.

ABSTRACTS

Oxidized Zinc Ores of Leadville, Col. By G. F. Loughlin. Pp. 91, pls. 8, figs. 7. Bull. 681, U. S. Geological Survey, Washington, D. C., 1918.

Although deposits of oxidized zinc ores at Leadville, Col., had been exposed in mine workings for many years previously, it was not until 1910 that their character and extent began to be realized. Since that year large quantities have been mined annually. Bulletin 681 begins with a review of early accounts of zinc carbonate and silicate and of the recent discovery of the orebodies. It then describes in detail the oxidized zinc ore minerals and minerals associated with them, the varieties of ore, their range in metal content, their distribution and extent, and their genesis. G. F. L.

Geology and Ore Deposits of the Yerington District, Nevada. By Adolph Knopf. Professional Paper 114. Pp. 68, pls. 5, figs. 12. U. S. Geological Survey, Washington, D. C., 1918.

The Yerington district in western Nevada is, next to Ely, the most productive copper district in the state. The oldest rocks of the district consist of andesites, keratophyres, and limestone, with subordinate shale, quartzite, and gypsum, all of Triassic age. They were intruded in post-Triassic time, probably early in the Cretaceous, by granodiorite, which was followed by quartz monzonite. These intrusions intensely metamorphosed the rocks they invaded and converted large areas into lime-silicate rock. After this metamorphism the region was cut by numerous dikes of quartz monzonite porphyry. Faulting then ensued, and along the faults ore-forming solutions arose and produced the copper deposits to which the district owes its economic importance. The Tertiary rocks, resting with marked unconformity on the Mesozoic group, are chiefly volcanic and are at least 7,000 ft. thick. They fall into three major groups, which are separated by two well-marked unconformities. The lowest subdivision consists of quartz latite, rhyolite, and andesite breccia; and it is probably the correlative of the Esmeralda formation of Upper Miocene age. The middle subdivision consists of andesite flows resting in places on the eroded edges of the rhyolites. The uppermost subdivision consists of subangular conglomerate overlain by basalt. The principal ore bodies consist of pyrite and chalcopyrite in a gangue of pyroxene, garnet, and epidote. They are replacement deposits of limestone developed along fault zones and are of the contact-metamophic type. The primary ore is essentially unenriched by later sulphides. The average tenor of the ore mined has ranged from 2.75 to 6 per cent of copper. A. K.

PERSONALS

Herbert C. Hoover is in California.

Charles S. Haley is now at Farmingdale, N. J.

Jay A. Carpenter was recently in Randsburg, Cal., on mine examination work.

S. J. Speak, of Hooper, Speak & Co., London, has been in San Francisco and is now at Trail, B. C.

G. L. Sheldon is returning to Denver from a month's professional work in Nevada, California and Montana.

H. D. Budelman, superintendent of the West End Consolidated, has returned to Tonopah from a trip through Siskiyou County, California.

F. M. Van Tuyl of the Malm-Wolf Co., made an examination of oil properties near Douglas, Wyo., for Wyoming interests during October.

W. J. Johnson, of New York, is at the New King of Arizona mine, seventy miles northeast of Yuma, Ariz., where he is developing water for milling needs.

W. P. Harlow, of Boulder, Col., accompanied by **George Teal,** consulting engineer, was recently in Jerome, Ariz., where he is interested in a number of properties.

Lyman F. Barber, until recently mill superintendent for the Black Diamond Co., at Walker, Ariz., has taken charge of the mill of the Swansea Lease, Inc., at Swansea, Ariz.

Robert E. Vinson, of the University of Arizona, has been making an investigation of the effects of the smoke of the United Verde smeltery on the surrounding vegetation.

Major Paul B. Davis, of New York, formerly of Organ, N. M., lately in France with the engineers, will open offices in El Paso, Texas, for the practice of mining engineering.

Dudley Dean, secretary and treasurer of Keweenaw Association, spent several days during the week of October 13 on the Gogebic Range, inspecting the mines owned by the association.

Sydney H. Ball, of the firm of Rogers, Mayer & Ball, has been made a chevalier of the Belgian Order of the Lion, in recognition of his work in developing the mining industry of the Belgian Congo.

H. H. Bellamy, a representative of the Sandavol Zinc Co., of Chicago, has been in the North Arkansas zinc field for several days, investigating the ore deposits of the field and buying carbonate concentrates.

Edward W. Berry and **Joseph T. Singlewald, Jr.,** of the Department of Geology, Johns Hopkins University, have returned from a trip of six months to Peru, Bolivia and Chile, made through the George Huntington Williams Memorial fund.

Charles Eugene Schneider, head of Schneider & Co., Creuzot, France, is a member of the French economic mission, which, along with similar missions from Great Britain, Belgium and Italy, will visit New York to inform the American public of the economic situation of Europe and advocate financial co-operation between the powers during the period of reconstruction.

G. H. Clevenger, vice-chairman and acting officer of the Engineering Division of the National Research Council, with office in New York, has given up his active supervision of the work of the council and will leave soon to fulfill a professional engagement in Mexico. Upon his return, some months hence, he will open an office in New York as consulting engineer, specializing in metallurgical lines.

R. B. Moore has been designated to succeed **Charles L. Parsons** as chief chemist of the Bureau of Mines. For several years Mr. Moore has been in charge of the Mining Experiment Station of the Bureau at Golden, Col., and he also was in direct charge of the radium work done by the Bureau. Mr. Moore will be succeeded at Golden by **S. C. Lind,** who has been serving at that station as physical chemist.

OBITUARY

James H. Conrad died at his home in Oakland, Cal., in the early part of October. Mr. Conrad was at the head of the famous Malakoff property at North Bloomfield, where he made his home for many years. He came to California from Pennsylvania in 1858 and served in the army during the Civil War. Following the decline of hydraulic mining, he was employed by an English syndicate to direct hydraulic operations in various parts of the world, but returned at intervals to North Bloomfield.

MINING SCHOOLS

Camborne School of Metalliferous Mining has secured the services of J. G. Lawn as acting principal and to conduct the mining classes until the governors find an engineer who can accept a permanent position. H. W. Hutchin has been appointed lecturer on assaying, taking the position formerly occupied by the late J. J. Beringer. Mr. Hutchin will continue some portion of his private practice, particularly his work for South Crofty.

INDUSTRIAL NEWS

Arthur M. Loeb & Co., Lima, Peru, desire to communicate with manufacturers of all kinds of mining and railroad equipment for the purpose of securing their exclusive agencies in Peru.

The Merchants' Association of New York has issued its year book for 1919, containing reports of the president and various bureaus, list of members and the rules and regulations governing the members' council.

Stewart & Holmes Drug Co., Seattle, Wash., will move about Jan. 1, 1920, to their new building, corner Occidental Ave. and King St. The assay and chemical supply department which has heretofore been in a separate building, will occupy the fourth floor.

E. V. Peters, general sales manager of the New Jersey Zinc Co., New York, left on October 10 for the West, to be gone a month on a business survey. Mr. Peters is accompanied by **R. M. Neumann,** manager of Western sales, with headquarters in Chicago. During their trip they will inspect various distributing warehouses which the company has established. Messrs. Peters and Neumann will visit, among other cities, Denver, San Francisco, Los Angeles, Portland, Ore., and Seattle.

National Foreign Trade Convention will be held at San Francisco, Cal., May 15-20, 1920. American firms represented at previous conventions have been requested to have their representatives, living or traveling abroad, time their visits to this country so as to take advantage of the opportunities afforded by this convention. Three special steamers, chartered for the accommodation of delegates from abroad, will be provided for the ports on the Pacific Ocean. Another steamer starting from New York, will go by way of the Panama Canal. Information regarding details of sailing and the program will be furnished by O. K. Davis, secretary, No. 1 Hanover Square, New York.

The Morse Bros. Machinery and Supply Co., of Denver, Col., is dismantling the Argentine and Grays Peak R. R. This road runs from Silver Plume, Col., to the summit of Mount McClellan, 14,000 feet elevation. It was equipped with 40-pound steel rails and

gasoline Shay locomotives. All of the material is being brought to Denver for resale. This company is also dismantling the Jerry Johnson 100-ton cyanide mill at Cripple Creek, erected in 1914. It was equipped with Dorr thickeners, agitators, classifiers and Olive filters. The material is also being shipped to Denver for resale. The 500-ton concentrator and 250-ton copper smeltery of the Penn-Wyoming Co. at Encampment, Wyo., is also being dismantled by the Morse Company. The 16½-mile Leschen tramway is also being prepared for shipment. This tramway was built in four sections of four miles each, and is available for immediate use. Over 96 miles of wire rope, 925 buckets, 196 towers, and tension stations, with complete terminal irons, make up the equipment. This was said to be the longest successful tramway in the world.

SOCIETIES

The Teknik Club, Denver, Col., held a dinner on October 13, which was followed by a program with addresses by Albert C. Crehore, on "Constants of the Ether," and Jay Lonergan on "Selling in China."

Canadian Mining Institute will hold the annual meeting in Vancouver on November 26, 27 and 28. E. T. Hodge, professor of geology at the British Columbia University, has been appointed general secretary.

Colorado Scientific Society held its regular meeting on Oct. 11, 1919, in Denver, Col. Captain Harry G. Burrowes, Engineers Corps, addressed the meeting on "Engineering Construction in France During the War."

American Institute of Electrical Engineers and the **American Physical Society** held a meeting October 10 and 11, 1919, in Philadelphia. The present status of theories of atomic structure was one of the subjects discussed.

California Metal Producers' Association will change its name at the annual meeting of the Association, Oct. 22, 1919, to "California Metal and Mineral Producers' Association." The offices of this association are at 625 Market St., San Francisco, Cal.

American Welding Society, 33 West 39th St., will hold a meeting on Oct. 24 at the Engineering Societies Building. The program is as follows: Address, by C. A. Adams; "A Theory of Metallic Arc Welding," R. G. Hudson; "Repairing a Lighthouse," J. H. Deppeler; "Gas Welding During the War," H. S. Smith; "Gas Cutting," F. E. Rogers; "Electric Resistance Welding," P. T. Van Bibber. A moving picture, "Repairing the Northern Pacific," will conclude the meeting. **J. H. Deppeler** of the Metal & Thermit Corporation has been elected a vice president of the American Welding Society, and **P. F. Willis,** president of the Henderson-Willis Welding & Cutting Co., has been elected a director of the society.

TRADE CATALOGS

Electric Hoists. Victor R. Browning and Co., Cleveland, Ohio. Pamphlet; 8½x11; 8 pp.; illus. Describes electric hoists built for general purposes, with details of various parts.

Suspension Baffle Walls. Kefauver and Kenney, Baltimore, Md. Pamphlet, 8½x11; 4 pp.; illus. Describes the application of suspension baffle walls for steam locomotives, with advantages claimed for this type.

Lea-Courtenay Co. of Newark, N. J., has recently issued two bulletins, Nos. H 4 and S 5. The first is a treatise on centrifugal pumps as well as a catalog of the company's most complete line, and the other is a synopsis of typical centrifugal pumps installed in various industries.

The Stowe Stoker. Laclede-Christy, St. Louis. Catalog, 7x10; 16 pp.; illus. Describes the Stowe Stoker, a new automatic type, for which is claimed an increased capacity and economy. A discussion of combustion problems with the effects of various factors is included.

C-H Rectangular Magnets. The Cutler Hammer Manufacturing Co., Milwaukee and New York. Pamphlet; 8½x11; 8pp.; illus. Descriptive of magnets adapted for handling regular shapes in steel and iron, including billets, slabs, round and square bars, pipe, and steel plate.

Stamp Mills. Allis Chalmers Manufacturing Co., Milwaukee, Wis. Bulletin No. 1432 C.; 8x10½; 52 pp.; illus. Describes stamp mills and accessory machinery for free-milling gold ores. A set of specifications for a ten-stamp mill with estimates of materials and supplies for one month's run, is included.

Material-Handling Machinery. The Osgood Co., Marion, Ohio; 8½x11; 32 pp.; illustrated. Describes steam shovels, cranes, clamshell outfits, and dredges manufactured by the company. The shovels are built in two types, the revolving, Nos. 18 and 29, carrying a ¾-yard and 1-yard dipper, respectively, and the Standard Railroad, Nos. 43 and 120, carrying a 1½-yard and a 6-yard dipper.

NEW PATENTS

U. S. patent specifications may be obtained from the Patent Office, Washington, D. C., at 5c. each.

Gases—Treatment of Gases Containing Sulphur Dioxide. Edward Victor Espenhahn. (1,315,183; Sept. 2, 1919.)

Gold-Washing Apparatus. John H. Fellows. (1,316,835; Sept. 23, 1919.)

Grizzly—Roller Grizzly. Leo Pinger. (1,313,011; Aug. 12, 1919.)

Ingot Molds, Antipiping, Means For. John Brunner. (1,315,944; Sept. 16, 1919.)

Jigging Apparatus and Process. William C. Prickett. (1,315,407; Sept. 9, 1919.)

Leaching—Process of Treating Copper Ores by Lixiviation with an SO2 Solution. Niels C. Christensen, assignor to Metallurgic Improvement Corporation. (1,316,351; Sept. 16, 1919.)

Lime—Method of Producing Lime. Arthur S. Dwight and Richard Lewis Lloyd, assignors to Dwight & Lloyd Metallurgical Co. (1,315,952; Sept. 16, 1919.)

Magnesium—Process of Producing Alkali-Earth Metals. Warren F. Bleecker and Walter L. Morrison, assignors to Electric Reduction Co. (1,311,378; 1,311,379; and 1,311,380; July 29, 1919.)

Melting Metals, Art Of. William H. Bristol, assignor to The Bristol Co. (1,315,206; Sept. 9, 1919.)

Mine Water—Process of Treating Mine Water and Product Thereof. Addison F. Hoffman. (1,315,836; Sept. 9, 1919.)

Nitrogen — Apparatus for Fixation of Atmospheric Nitrogen. James Simpson Island. (1,316,445; Sept. 16, 1919.)

Platinum Metals—Process of Recovering. William C. Furguson, assignor to Nichols Copper Co. (1,315,660; Sept. 9, 1919.)

Powdered Coal—Apparatus for Burning. Aubrey J. Grindle, assignor to Combustion Economy Corp. (1,315,719; Sept. 9, 1919.)

Pulverized Coal—Combustion Process and Apparatus for Practicing the Same. Ulysses A. Garred, assignor to Garred-Cavers Corporation. (1,311,807; July 29, 1919.)

Roasting—Method of and Apparatus for the Heat Treatment of Finely-Divided Materials. Francis O. Blackwell and Nathaniel H. Emmons, 2d. (1,315,460; Sept. 9, 1919.)

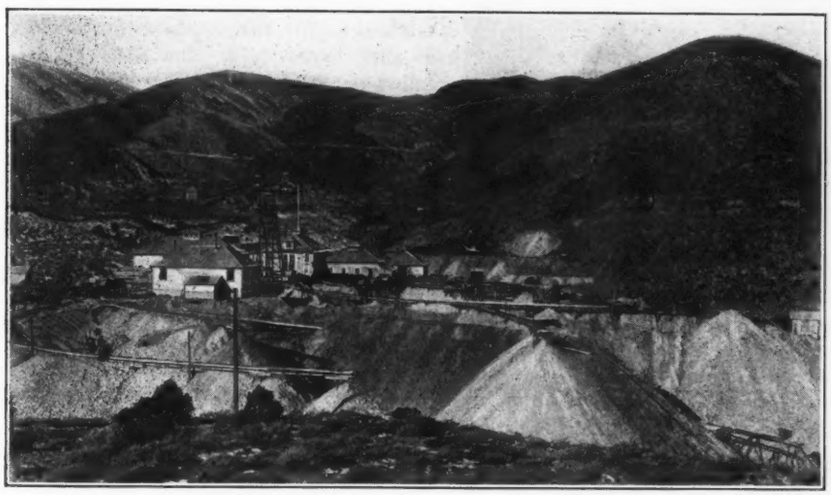
Screen. Frank E. Johnson, assignor to American Manganese Steel Co. (1,312,545; Aug. 12, 1919.)

THE MINING NEWS

New York, October 18, 1919

Comstock Lode to be Diamond Drilled

Diamond drilling is to be employed on the Comstock lode at Virginia City, Nev., to prospect the ground below the Sutro tunnel, which is 1,640 ft. below the surface. The work will be done by the Middle Mines Association, together with various Eastern interests. H. L. Slosson, Jr., president of the Association, is quoted as saying, "People in the East have taken control of the Savage, Chollar and Gould & Curry mines, which mines have produced above the Sutro tunnel (1,640 level) over $55,000,000. The Best & Belcher is to co-operate with them in the plan and the Potosi company has agreed to exploration proposed. No work of any character has been done between the Sutro tunnel level and the 2,300 level. The combination shaft controlled by these companies is now open to the Sutro tunnel level and for some distance below. We have during the last 90 days equipped it with electric hoist and air compressor, new cables, etc., and are now carrying down air pipe to operate the diamond drill at the tunnel level."



VIEW SHOWING SURFACE PLANT OF THE UNION MINE, COMSTOCK LODE, VIRGINIA CITY, NEVADA

Drilling in Northern Ontario for Iron Ore

The Leitch iron ore lands east of Lake Nepigon in northern Ontario are being diamond drilled by Smith & Travers, of Sudbury, Ont., for American interests. This work is in charge of C. H. Hitchcock. The option on this tract has recently been extended and drilling will be continued. The work is said to have disclosed bodies of hematite ore. The Little Long Lake iron lands on the same range have recently been examined by J. C. Murray. These lands are owned principally by H. E. Knobel and John W. Wolvin, of Port Arthur.

Conditions Good in Grass Valley District, California

Labor disturbances in the Grass Valley district of California are believed to be over. The conservative element among the miners is in control and any further difficulty is confidently expected to be improbable or, if it arises, to permit of settlement without a strike. A secret ballot has been inaugurated in the unions and as a consequence the vote on questions affecting the welfare of the men more adequately represents the thought of the workers. A careful observer familiar with the facts said that the strike would not have occurred if the secret ballot had been in use. More than half of the miners employed are men of family who have worked for the companies under favorable wage and living conditions for a long time. The unmarried miners and the drifters who are necessary to complete the complement of workers at the various properties constitute the real problem. The high cost of living has not affected them since board and lodging is as low as $35 per month and a single miner can save $50 per month from his wage of from $100 to $120 per month. With this surplus they are inclined to lay-off when they have accumulated a small stake. The result of this tendency is to bring the requirement for the number of miners of this class up to double the normal number.

There is encouraging activity in the district. Both the Empire and the North Star mines are recovering rapidly from the effects of the unfortunate strike. At the Idaho-Maryland unwatering operations are proceeding rapidly and a second air compressor is being installed. Other properties are also operating. The Banner properties on Banner Mountain are reported to have been purchased and added to the holdings of the Central Consolidated Mining Co.

Gold Rush to Hampton Plains

Recent Discovery in Western Australia Drawing Many - Present Indications Promising

The facts relating to important gold finds in Western Australia during the last summer are given by the following dispatch from the Premier at Perth, W. A., to J. D. Connolly, Agent General for Western Australia:

"In June this year party prospectors found large ore formation on Block 50, freehold property, held by Hampton Properties, Ltd., situated 22 miles south of Kalgoorlie. Shaft sinking disclosed lode formation 25 ft. wide and ore channel can be traced north and south for considerable distance. Country rock is similar to the Boulder belt. Formation is oxidized to depth of 60 ft., composed of ferruginous quartz and soft lode formation and assays high values. If developments continue as at present, it is one of the most important auriferous developments found for many years.

"About half-mile eastward another ore formation has been disclosed showing visible gold. Surface indications of ore are good, but developments are necessary before anything definite can be said. A considerable number of leases have been taken up."

During September the Hampton Properties issued 268 mining licenses and received application for 170 leases. Little is being done, it is said, pending completion of the survey.

Strike Settled at Tonopah and Divide

After considerable delay and much uncertainty the labor difficulties of the Tonopah and Divide districts have been settled and work has been resumed at a number of properties. It will take some time before operations become normal, for many of the best miners and skilled mechanics have gone to other localities and some will remain away permanently. It is largely due to the efforts of Governor Boyle that the difficulty was finally adjusted. To prevent further interference with the workmen who are returning to their work an injunction has been issued by Judge Averill of the local Nevada court restraining certain persons connected with the I. W. W. and such other persons who may be associated with them from interfering with miners or from claiming that any authorized strike is in course at Tonopah and Divide. The order prevents any interference of whatever nature with the workmen.

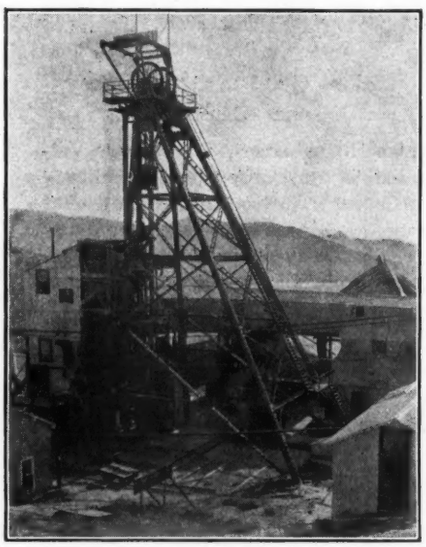
Globe-Miami District to Have "Safety First Week"

The Mine Rescue and First Aid Association of the Globe-Miami district, in Arizona, has undertaken a crusade to promote the safety of the community. To this end the week of Oct. 19 to 25 has been set aside as "Safety First Week" and the aid of all civil and industrial departments in the district has been asked in making the thing a success. It is planned to carry out the Association's program by means of proclamations by the Mayors of Globe and Miami, by four-minute talks to school pupils by their teachers, and by similar talks in theatres and to men as they go on shift in the various plants. The district has been placarded with "safety-first" mottoes and the support of newspapers and local merchants obtained.

New Cornelia Plans Future Construction

The plans of the New Cornelia Copper Co. have been definitely outlined by J. C. Greenway, general manager. The 500-ton mill is working well, but the experimental work may have to be continued for about ten months, which is considered sufficiently long to determine the best methods to adopt for concentrating the local ore. A 5,000-ton concentrator will then be built and may be in operation within three years. It is estimated that with a daily demand for 5,000 tons of ore, the surface carbonates and oxides will last from six to eight years. They will be taken out by steam shovels and reduced in the leaching pits. By the end of this period a second 5,000-ton flotation unit will probably be in operation, thus continuing a daily draft on the mines for 10,000 tons of ore. Much of the sulphide for the mill yet is to be uncovered by the shovels working on the carbonates, though even now a large sulphide supply is available through development in nearby ground acquired by the company. The sulphides are richer than the surface ores, so concentration will give much larger bullion returns.

It is planned also to establish a smeltery, probably of reverberatory type. It is possible that the bullion also will be refined at Ajo, to save transportation costs. The necessary sulphuric acid can be obtained, as it is now, from the Calumet & Arizona acid works at Douglas.



MAIN SHAFT, TONOPAH-BELMONT DEVELOPMENT CO., TONOPAH, NEV.

Homestake Fire Still Burning

The fire in the Homestake mine, at Lead, S. D., which started on Sept. 25, as reported in the last issue, broke out when miners blasted down a timbered raise on the 800 level. Water was turned in from the 600 and 700 levels and for a week the blaze was confined to the stope where it began. Openings were driven on the upper levels for water lines. The fire could not be reached from the 800 level and all openings leading from the burning stope were bratticed off to confine the gas. On Oct. 2 the fire reached the 700 level and on Oct. 4 it was decided to flood the workings to the 600 level. All machinery from lower levels was hoisted and all mine work suspended. All mills were also shut down owing to the need of all available water. Flooding to the 600 level will probably take about five weeks. Suitable work will be found by the company for all employees during the temporary shut down of mine and mills. The fire continues to burn between the 700 and 600 levels.

During the fire in the same mine in April, 1907, it required 47 days to fill from the 1,550 level to the 200 level, and took 622,257,232 gals. of water. Today the mine is over 2,000 ft. deep, but the lower levels have not been opened to any great extent. If the fire can be held below the 600 level it should not take as long to fill the mine as it did in 1907. The 600 level and those above are larger than those below. Another advantage of keeping the fire below the 600 is that work can be resumed immediately after the fire is extinguished.

Labor Quiet on Mesabi Range

Steel Strike Fails to Close Down Mines—Some Men Out at Ely From Other Causes

The steel strike has thus far been absolutely devoid of direct results in closing down even one iron ore mine on any of the Minnesota ranges. Because of vessel congestion at lower lake ports many operators have been forced to mark time for two or three shifts out of each week since the strike was called, while others have been able to revise their schedules and put excess steam shovels to work stripping and doing other dead work around the pits while awaiting the return to normal conditions. A small strike of purely local nature has interfered with the operation of Chandler mine at Ely on the Vermilion Range, two foreign elements disagreeing on the desirability of a certain boss and leaving the operator in the position of facing a strike regardless of the course he might choose. Though short handed the mine has continued to operate. The striking element have continued to strike in spite of efforts toward conciliation by townspeople and officials, and have now increased the demands to include those championed by the I. W. W. in 1916; namely, the abolition of the contract system with a minimum of $6 per eight-hour day. The trouble has also spread and the Sibley, Zenith and Pioneer mines are now closed down. Radical agitators are infesting all mining camps on the Mesabi Range, but are making no headway.

New Baltic and New Arcadian Companies Consolidate

A merger of the New Baltic and New Arcadian Copper companies has been effected. Shareholders unanimously approved the plan at a meeting held in Houghton, Mich., on Oct. 7. The new company will be known as the Arcadian Consolidated. Assessment will be avoided by leaving 43,000 shares in

the treasury to be marketed. Exploration results in the Baltic shaft were said to be promising at the time operations were suspended.

Seneca Buys Mill Site

The Seneca Mining Co. has purchased a mill site from Calumet & Hecla on the shore of Lake Superior. The site consists of 340 acres just west of the town of Eagle River, in Keweenaw County, Mich. This road will be down grade practically all the way to the mill. Underground, the showing continues good. Shaft sinking has been resumed. The lateral work on the first level, comprising 450 ft., has been completed to the boundaries. Second level lateral work has been under way since Oct. 1.

Representatives of Arizona at St. Louis Convention

The following named have been appointed by Governor Campbell to represent Arizona at the session of the American Mining Congress at St. Louis Nov. 17 to 21: A. T. Thomson, Douglas; F. W. MacLennan, Globe; Norman Carmichael, Clifton; M. Curley, Ajo; J. Kruttschnitt, Jr., Tucson; W. C. Browning, Superior; G. M. Colvocoresses, Humboldt; J. A. Burgess, Oatman; Ezra W. Thayer, Phoenix, and W. B. Marvin, Yuma.

Boulder, Colo., Association Formed To Help Prospectors

Grubstaking of prospectors is the object of the Gold Mining & Improvement Association recently organized at Boulder, Col. The officers of the Association are James M. Platt, president; C. M. Pruden, vice president; Moses Hoover, treasurer, and Delia Mulford, secretary. The other directors are W. G. Houston, Charles M. Keith, John H. Du Bois and Mary N. Morehouse.

Canadian Geological Research

Dominion Geological Survey Work In British Columbia Covers Extensive Territory

In the course of its work during the last summer the Dominion Geological Survey had several parties at work in various districts of British Columbia. One party, in charge of J. J. O'Neill, who was geologist with the Stefansson Arctic expedition, covered the Salmon River district at the head of Portland Canal. In this district is the Premier mine as well as the Big Missouri group and other prospects of promise. The Cariboo country was covered by the party of B. R. McKay, who is making a geological survey of the placer gold deposits. A party in charge of L. Reinecke worked the section lying along the Pacific Great Eastern Ry. between Clinton and Quesnel. The soda lakes of this area will be made the subject of a special examination by Mr. Reinecke. The Slocan district was covered by M. F. Bancroft, who is completing a geological survey of the district which was begun years ago and was almost completed by the late O. E. Le Roy.

V. Dolmage with his party was engaged in surveying the west coast of Vancouver Island. The Britannia area along Howe Sound was covered by S. J. Scholfield, who is making a detailed examination of the district. In the Bridge River country, S. C. McCann is preparing a geological map and is comparing the geology of the district with that of the Grass Valley district of California. Charles Camsell, who is in general charge of the Survey's work in British Columbia, spent a few weeks in the Coquihalla River section examining the district.

Concentrator for Rossland, B. C.

Consolidated Company Decides to Erect Plant—May Also Build Mill At Kimberley

At a joint meeting between the officials of the Consolidated Mining & Smelting Co. of Canada and those of the city of Rossland, B. C., on Sept. 27, arrangements were practically concluded by which the company will build a 5,000-ton concentrator in Rossland city. Sufficient water has been assured, and the company has placed its engineering staff at the city's disposal in order to expedite the preliminary work. S. G. Blaylock, general manager of the company, announced that, now that a water supply was assured, he was anxious to get the building roofed before the snow came. Construction is to be of reinforced concrete, and the roof will be of sheet zinc supported on steel rafters. It is expected that the plant will be in operation within a year. There is also a persistent rumor that the same company will build a 10,000-ton concentrator at Kimberley, where the Sullivan mine, its largest producer, is situated.

PROGRESS OF MINING OPERATIONS

Important Events of Interest Condensed and Classified for Easy Reference

ARIZONA

Graham County

Arizona Leasing (Klondyke)—Company organized to take over Grand Reef and some other groups in Klondyke district. Active development soon will be under way on principal properties.

Mohave County

Cerbat Tunnel surveyed into mountain three miles. Geological and mineralogical survey of district now in progress.

Placer Ground near Colorado River to be handled by dry washing plant which is to be installed by H. L. Harris.

Chloride Queen (Chloride)—Working steadily on Silver Mountain and Sunday School groups. Double-compartment shaft sunk to 256 ft., with 320-ft. drift on 200 level. Ore generally is high-grade silver.

Golconda (Chloride)—New mechanical equipment being installed by Highland Mining Co.

Hidden Treasure (Chloride)—Chloride Mining Co. is clearing out old workings.

Memphis (Chloride)—Taken over by Dardanelles Mining Co. from Miss Anna Durkee, of New York.

Schenectady (Chloride)—Sold to J. McMillan and associates; will unwater and start development at once.

Steffy (Chloride)—Foreclosed to Thompson-Dudley Machinery Co. Machinery, including mill, will be sold.

Arizona Butte (Kingman)—Starting work on big tunnel at Stockton Hill, with full equipment necessary.

Bunker Hill (Kingman)—Property, east of Cerbat, taken over from John Mulligan by H. E. Smith. Vein, cropping for 700 ft., runs high in silver.

Cleopatra (Kingman)—Property near Bill Williams Fork reported to have developed 200,000 tons of copper ore of good grade. Inspection lately made by representative of Humboldt Smeltery.

McKesson (Kingman) — Machinery from Tipperary mine at Oatman being transferred to its property near Wallapai.

Pawva (Kingman)—Purchased and will operate Last Chance mill on ore from 180 level. G. W. Gibson in charge.

Senate Silver (Hackberry)—Sinking inclined shaft and drifting from 200 level.

United American (Kingman)—Work resumed with full crew. Shaft to be sunk within 90 days to 500 ft., where drifting will be started. W. K. Ridenour, president, at the camp.

Pima County

New Cornelia (Ajo)—September production of copper 3,898,000 lb., comprising 3,092,000 lb. cathodes, 334,000 lb. smelting ore, and 472,000 lb. cement copper.

El Tiro (Silver Bell)—Fair grade copper ore shipped regularly to Hayden smeltery. Produced 500,000 lbs. since July 1, repaid all development and rehabilitation costs and has treasury balance. Has exceptional railway facilities and good electric equipment. Percy Williams, manager.

Arizona-Tucson (Tucson)—Sinking 2-compartment shaft on the property, in Amole district, 8 miles south of Tucson.

Dawson Metallurgical (Tucson)—Has completed 85-ton Dawson-type furnace near Narragansett mine, in Rosemont district, 42 miles southwest of Tucson. W. A. Doyle, president, in charge.

Mina Mexicana (Tucson)—Taken over by the Suffern Company, of New York, which has started development.

Yavapai County

Jerome Superior (Jerome)—Below 700 ft., shaft cut 4-in. streak of brown hematite, considered encouraging sign. Hoisting 140,000 gals. a day. George Mitchell, general manager.

Tuscumbia (Jerome)—Old Tuscumbia mine in northern slope of Bradshaws about 4 miles from famous Peck mine, taken over under lease and bond by George Kingdon and others. About one month was spent in sampling. Large force has been employed and new camp built. In early days Tuscumbia had remarkable record of production and its bullion output exceeded that of its neighbor, the Peck.

Copper Queen Gold (Mayer)—Will build 100-ton flotation mill; contract let to Kennard & Bierce, of Los Angeles.

Henrietta (Mayer)—Installing electric hoist for sinking from main tunnel.

Silver Belt (Prescott)—First carload shipped to El Paso from 250 level, netted $5,000. Company will sink from old workings on 3-ft. vein of high-grade ore. Ben Rybon in charge.

CALIFORNIA

El Dorado County

Pacific Deep Gravel (Placerville)—Six hundred acres seventeen miles east on Lincoln Highway, sold by J. H. Zimmerman of Placerville, to J. E. Sexton, Eugene Davis and others, of Eureka and New York. Development includes old 400-ft. cross-cut tunnel and air-shaft; will drive new cross-cut at deeper level. Fifteen men at work. Will Christian in charge.

Placerville seriously threatened by encircling forest fires on Sept. 24. Buildings on Poverty Point and Baring Gould properties were burned down.

Kern County

California Rand Silver (Randsburg)—Dividend of $96,000 declared. Former sheriff J. W. Kelly, president.

Nevada County

Allison Ranch (Grass Valley)—Mill being operated eight hours per day only, on account of scarcity of profitable ore. Consolidated Mines Co. driving development drifts east and west of shaft and hope to cut Hartery and Omaha ledges.

COLORADO

Boulder County

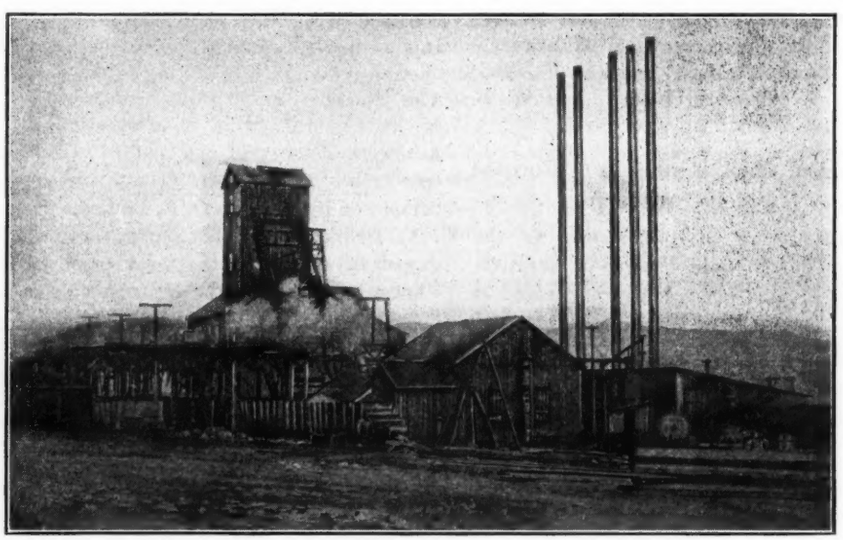
Golden Edge (Boulder)—Property in Argo tunnel bonded to Eastern interests. Much work done in retimbering, catching up caved ground and driving raises and skipways. Large tonnage expected from tunnel and upper levels. Al Weinberger, general manager, and T. D. McGuire, superintendent.

Eagle County

Horse Mountain M. & M. (Eagle)—Company in Fulford Mining District, 70 miles from Eagle, operating Lady Bell group. About 175 cars of high-grade gold-silver ore was shipped, in removing of which a large body of low-grade ore was developed. Now planned to build mill. J. O. Kempf, president; John Welsh, vice president; S. A. Mock, secretary-treasurer.

Gilpin County

Ottawa Group (Alice)—Property 10 miles north of Idaho Springs, consisting of 8 lode claims and mill-site, purchased for $50,000 from John F. Kaminky, by newly organized Roosevelt Mining & Milling Co., composed of five business men of Newark, N. J.



SURFACE PLANT OF WOLFTONE MINE, LEADVILLE, COL.

Idaho-Maryland (Grass Valley)—Test run made for unwatering 1,000-ft. vertical shaft. Pumping will be done with old electric-driven Cornish pump formerly used.

Cold Springs and Buckeye group of claims in Willow Valley sold by W. G. Motley of San Francisco to Mrs. L. M. Hoge of Nevada City. Buckeye hoisting plant and Cold Spring mill included. Hoge interests driving long tunnel to tap quartz veins and gravel, and erecting 15-stamp mill near tunnel mouth.

Plumas County

Engels Copper (Engelmine)—Company's Superior mine showing high-grade average ore. Developed by 2,200-ft. tunnel; 20 men employed. Nathan Shapiro in charge.

Gunnison County

Ruby Consolidated Silver (Irwin)—Company with property two miles off Crested Butte Branch Railroad has set aside $30,000 for development.

Pitkin County

Ethiopian (Quartz)—Operations suspended owing to poor market. Has 4-ft. vein of high-grade amorphous-graphite.

San Juan County

Valley View Leasing (Telluride)—Constructing mill to treat ores from San Bernardino group which it is operating under lease.

MICHIGAN

Copper District

Champion (Painesdale)—Maintaining tonnage of ore running 40 lb. per ton refined copper. Baltic and Trimountain mines of same group making better than 32 lb. average.

Mass Cons. (Rockland)—Now shipping 500 tons daily and plans further increase in output. September ore shipments totaled 14,000 tons.

Gogebic Range

Norrie-Aurora (Ironwood)—New locomotive crane with long boom and clamshell in use on coal docks to spread coal away from dock. Former practice of Lake Superior mines of storing part of winter coal supply in railroad ore cars is no longer permitted by R. R. Administration.

Pabst (Ironwood)—"H" shaft crosscut on 24th level cut through footwall into ore 966 ft. north of shaft on Oct. 1. In last two months crosscut was driven 441 ft. in slates; 8x15-ft. heading, three shifts, six men each, with mucking machine and five drills. Considerable time lost because of powder gas, no ventilating system used.

Puritan (Puritan)—Miner buried and suffocated Oct. 11 on 70 ft. sub. of 14th level. Piece of capping rock fell in stope and caused run of ore.

Morgan (Wakefield)—Being developed with force of 25 or 30 men. Railroad not yet in, and all ore hoisted has to be stocked. Property farthest east of operating mines of the range. Orebody tested by extensive drilling before development was begun. Operated by Thomas Furnace Co., of Milwaukee, who can handle siliceous ores found on this property.

Marquette Range

Barnes-Hecker (Ishpeming)—Armstrong loader installed underground; first on Marquette range.

South Jackson (Negaunee)—Pit loading suspended for season. Never operates during winter.

Menominee Range

Oliver Iron (Stambaugh) — Dober mine ceased shipping for season.

Pickands, Mather (Iron River)—Shipments stopped from James, Balkan, James, Caspian, Bengal, Fogarty and Baltic mines. Balkan only property to reduce force. Stocking room scarce at Balkan.

McKinney Steel (Crystal Falls)—Dunn, Tobin and Odgers mines are idle. Probably will not resume until spring.

Amasa-Porter (Amasa)—Ore now being hoisted and stocked.

MINNESOTA

Cuyuna Range

Northland (Cuyuna)—Developing and stockpiling manganiferous ore.

Mahnomen (Ironton)—Has been shipping special manganiferous ore all rail to an interior furnace. Ore assayed high 28 per cent manganese and 29 per cent iron, or a combined content of 57 per cent dried.

Thompson (Ironton)—Inland Steel Co. is relinquishing Haley-Keating lease, operated since 1913, as property is exhausted. Equipment and plant will be used in mining the SW. ¼ of SE. ¼ of Section 2-46-29, a State lease known as the North Thompson, which was stripped two years ago and has been operated as an open pit.

Whitmarsh Mining Co. (Ironton)—Closed down both its mines, Martin and Huntington. About 25,000 tons in stockpile at each property. Will allow mines to fill with water.

Sagamore (Riverton)—Stripping contract completed. Winston-Dear Co. loading ore in pit. Will ship 100,000 tons manganiferous ore this season. Experimental washing in Rowe washing plant is giving excellent results in eliminating excess fines and moisture.

Huntington (Sec. 9-46-29)—Reduces force temporarily awaiting more favorable turn of market. Whitemarsh Mining Co., operators.

Joan No. 4 (Trommald)—Shaft of this manganiferous property of Marcus L. Fay, which has been closed down since December, 1918, mysteriously caved and disappeared from view on night of September 30.

Omaha (Woodrow)—Miners' strike adjusted; underground operation resumed. Drying plant shut down for repairs. Eighteen gangs one shift in straight shipping ore. Installing auxiliary electric hoist. Omaha Iron Co., Chicago, operators.

Mesabi Range

Wisconsin Steel (Chisholm)—Subsidiary of International Harvester Co. has begun developing underground mine, including three forties in NW. ¼ of Section 27-58-20. Property leased from Great Northern, reported to contain 10,000,000 deposit. C. R. Emerson, local superintendent.

Jean (Eveleth)—Small underground mine of Kingston Mining Co. worked out. Total shipment, 109,139 tons since opening in 1916.

Oliver Iron (Eveleth)—Will build 100 residences and one modern flat building; at Hibbing, 19 residences and one flat building; Coleraine, 32 residences; Eveleth, 25 residences; Ely, 24 residences. Call for bids on 140-room hotel to be erected in new addition to Hibbing.

West Adams (Eveleth)—Fault Mining Co. operating small revolving shovel stripping old caves. Expect to recover large tonnage of high-grade lost through earlier careless methods.

MISSOURI

Newton County

Heaton-Hodges (Granby)—First of two shafts started in 1918 now 17 ft. into ore revealed at 230 to 250 ft. by diamond drilling of Trentland. Runs better in lead and zinc than drillings indicated. Charles O. Hodges, of Dallas, Tex., president. This will be the first producer in new district. Several other companies have started shafts.

MONTANA

Beaverhead County

Boston and Montana Development (Wise River)—Line of Montana Southern Ry., proposed as outlet for ores of Elkhorn mines, will be completed to these properties about the middle or latter part of this month, according to local office of Boston & Montana.

Silver Bow County

Butte-Bullwhacker (Butte)—Tonnage shipped to Anaconda's leaching plant being increased to more than 100 daily.

Butte-Duluth Copper (Butte)—Grade of about 2 per cent copper being maintained in shipments to the Washoe reduction works.

Butte and Superior (Butte)—Development program for Butte-New York territory adjoining Black Rock mine, controlled by Butte & Superior, includes crosscut from 1,800 of Black Rock. Butte-New York ground cut on 1,200 level said to be promising.

Crystal Copper (Butte)—Showing in "B" vein continues good, more than 2½ ft. of ore being in sight with grade high in silver and gold values.

East Butte Copper (Butte)—Showing on 1,800 level is reported to be improving. Tonnage grade running well.

North Butte (Butte)—Ore reserves of Granite Mountain and Speculator mines standing at high point in number of years, according to unofficial reports. Output being increased.

NEVADA

Mineral County

Simon Silver Lead (Mina)—Burch, Hershey & White appointed engineers.

Pershing County

Loring (Lovelock)—Excavating for 30-ton Gibson mill of Jose-Davis company finished and concrete foundation will be put in at once. Tunnel on company's lease on Sheepherder still shows full face of good ore.

Nevada Honey Bee (Lovelock)—William J. Loring, manager, has started systematic prospecting of service, without interfering with regular development. Malley shaft down 125 ft. and Benedetti tunnel in 262 ft.

Storey County

Consolidated Virginia (Virginia City)—For week ended September 26 Consolidated Virginia extracted 137 tons of good-grade ore from point 60 ft. east

in new vein on 2,150 level and 88 tons from point 30 ft. southwest in same vein.

Mexican Gold and Silver (Virginia City)—Opening new level at 1,900-ft. point of 2,000 raise and crosscutting east and west. Enlargement of cyanide plant continues.

Ophir Silver (Virginia City)—From 1,900 level there were extracted 41 tons of good-grade ore in week ended September 26. Prospecting continues on 1,465, 1,600, 1,800, 1,900 and 2,000 levels.

SOUTH DAKOTA

Custer County

At Fairburn, first rig to be used in drilling for oil in this new field has arrived, and will be set up at once. Structure said to be good, and all land within area leased. Although no oil has ever been developed in vicinity, oil men claim indications are satisfactory.

Lawrence County

Gold Stone (Deadwood)—Articles of incorporation filed. Capital $125,000. Company has leased Rainbow mine in Maitland district, and will also work adjoining properties which they own. Incorporators—Solomon Burns and N. T. Mason, Deadwood, and Mark J. Little, Pittsburgh, Pa.

Echo (Maitland)—Sinking of shaft approaching 200 level. Good grade of lead-silver ore cut in sinking.

Mogul (Terry) — Operations suspended owing to labor shortage and increased cost of production. Mill in continuous operation since completion of new plant in 1914.

UTAH

Juab County

Tintic shipments week ended Oct. 4 totaled 120 cars.

Electric power has been installed recently by over 12 companies of East Tintic district.

Goshen Valley R. R. is rapidly completing a spur to Iron King and Tintic Standard properties.

Apex Standard (Eureka)—Small bunch of promising ore opened on 900 level 100 ft. from shaft. L. W. Merriman, president.

Lehi-Tintic (Eureka)—Developing ore opened on 900 level through lower tunnel. Shaft sinking deferred. Will build tramway. Working on surface plant.

North Standard (Eureka)—Sinking suspended while drifting for ore on 500 level.

Sioux Consolidated (Eureka)—Damages of $7,500 for failure to buy and hold block of stock of this company awarded to James Morgan, of Nephi, against W. H. Child & Co., brokers of Salt Lake City. Suit was brought for value of stock dividends paid while company was making payments and interest which amounted in all to $17,000.

Tintic Standard (Eureka)—Producing 100 tons silver-lead ore daily from 1,000 level. Hauling by truck to Denver & Rio Grande main line.

WASHINGTON

Kittitas County

Great Western Silica (Roza)—Building 25-ton mill for pulverizing crude diatomaceous earth. Extensive deposits opened on Squaw Creek, nine miles from Roza.

F. M. Handy & Keller (Valley)—Hauling magnesite from Double Eagle quarry by motor truck.

Majestic Diatomaceous Earth (Wymer)—Producing about 10 tons of finished material daily.

Lincoln County

Drum Lummon (Miles)—Producing good grade of silver ore from property south of Crystal Buttes. Will truck to Davenport for shipment. M. H. O'Connel in charge.

Okanogan County

Copper World Gold (Loomis) — Leased for five years to E. Dempster, of New York, who expects to expend $25,000 to $30,000 in next year in equipment and development. Dempster also has lease with eight years to run on Copper World Extension adjoining, from which he shipped 4,000 tons last year and where 35,000 tons are said to be blocked out. Copper World, said to have mineral zone 100 ft. wide within which is 17 feet of sulphide ore. Tramway 2¼ miles long has been built to Copper World Extension, at cost of $45,000, and will be extended a few hundred feet to Copper World.

Kaaba Mines (Oroville)—Installing mine plant with 600-cu. ft. compressor 4,000-lb. hoist and electrical equipment. J. W. Douglas, president.

Stevens County

Gladstone Mountain (Boundary)—Chimney of lead ore struck within short distance of Electric Point line. Ore is of similar grade to that found in chimneys on Electric Point ground. Body 26 ft. wide and of unknown length. Shaft will be sunk 100 ft. and at same time crosscut will be run into chimney from 260-ft. level in main shaft. Holdings surround Electric Point on three sides.

Electric Point (Northport)—Ore accumulated in bunkers before temporary suspension is being shipped. Ore chimney recently opened being developed. Mine now developed to 800 level. Aerial tramway to Leadpoint successful and 7-mile extension to Woodspur being surveyed.

CANADA

British Columbia

Cork-Province (Ainsworth) — Shipments suspended since August. Considerable ore and several carloads of concentrates on hand.

Snowstorm Group (Ashcroft)—Diamond-drill exploration by the Provincial Government in Highland Valley disclosed high-grade copper, and will be resumed after further surface work on Iona claims of this group. W. S. Drury will survey the property.

Lenora (Cowichan, Vancouver I.)—Being opened up by G. D. B. Turner, who is now on the ground. A. Meagher in charge.

North Star Mine (Kimberley)—Operations affected by strike of metal miners. Was expected to regain a shipping basis shortly, as damage from recent fire has been repaired. O. C. Thompson and J. L. McKinney, owners.

Gold Plate-Humming Bird (Nelson)—Group of claims at head of Roaring and Five Mile creeks being reopened and developed by owners.

Ontario

La Rose (Cobalt)—Has unwatered and started to work No. 3 shaft of University Mine, which has been under water for ten years.

Mining Corporation (Cobalt)—Shipped 100,000 oz. of silver bullion.

Nipissing Extension (Cobalt)—Has arranged to start development of its properties.

Hunton-Kirkland (Kirkland Lake)—Shareholders have rejected offer of H. Cecil to take option on property.

Lake Shore (Kirkland Lake)—Has resumed operations. Property has been closed for several months on account of strike.

Argonaut (Larder Lake)—Former Mine d'Or Huronia, has completed changes and extensions to mill, and is now ready to operate. Main shaft will be sunk to 200 level.

La Mine d'Or Huronia (Larder Lake)—Taken over by Argonaut Gold Mines, Ltd., as close corporation organized in Montreal. J. E. Hardman is consulting engineer, and John W. Morrison, formerly manager of Lake Shore Mine, Kirkland Lake, is general superintendent. Much exploration work already done. Property close to Beaverhouse Lake.

Clifton (Porcupine)—Has cut main vein on 100-ft. level, where it shows much free gold. In 1913 open cut on this vein shipped 80 tons to smeltery, average $155 per ton.

Davidson (Porcupine)—Will do large amount of diamond drilling to explore vein on 1,200 level.

THE MARKET REPORT

Daily and Weekly Metal and Mineral Prices
Metal Market Conditions, Average
Monthly Prices, Stock Quotations

Silver and Sterling Exchange

Oct.	Sterling Exchange	Silver		Oct.	Sterling Exchange	Silver	
		New York, Cents	London, Pence			New York, Cents	London, Pence
9	417¾	117⅛	63	13	Holiday	Holiday	62¾
10	418¼	117	62⅞	14	417¾	117¼	63 1/16
11	418¾	117⅛	62⅞	15	417	118¼	63¾

New York quotations are as reported by Handy & Harman and are in cents per troy ounce of bar silver, 999 fine. London quotations are in pence per troy ounce of sterling silver, 925 fine.

Daily Prices of Metals in New York

Oct.	Copper	Tin	Lead		Zinc
	Electrolytic	Spot	N. Y.	St. L.	St. L.
9	21¾	54½	6.25@6.30	6.00@6.10	7.40@7.50
10	21¾	54½@55	6.25@6.30	6.05@6.10	7.40@7.50
11	21¾	54½	6.25@6.30	6.05@6.10	7.40@7.45
13	Holiday	Holiday	Holiday	6.10@6⅛	7.⅜@7.40
14	21¾	54½@54¾	6¼@6½	6.10@6.15	7.37½@42½
15	21¾	54½	6¼@6½	6.15@6.20	7.40@7.50

The above quotations are our appraisal of the average of the major markets based generally on sales as made and reported by producers and agencies, and represent to the best of our judgment the prevailing values of the metals for the deliveries constituting the major markets, reduced to basis of New York, cash, except where St. Louis is the normal basing point.

Quotations for copper are for ordinary forms of wire bars, ingot bars and cakes. For ingots an extra of 0.05c. per lb. is charged and there are other extras for other special shapes. Cathodes are sold at a discount of 0.125c. per lb.

Quotations for zinc are for ordinary Prime Western brands. We quote New York price at 35c. per 100 lb. above St. Louis. Tin is quoted on the basis of American tin, 99 per cent grade.

London

Oct.	Copper			Tin		Lead		Zinc	
	Standard		Electrolytic						
	Spot	3 M.		Spot	3 M.	Spot	3 M.	Spot	3 M.
9	104	103¾	113	281	282	27⅝	28½	43½	43½
10	104¾	104½	114	283	284	27⅝	28⅜	42¾	43½
11	....	....	....	....	....	....	....	....	....
13	106½	106½	114	283	284½	27¾	29	43½	44½
14	106	106½	115	281½	282½	28½	29¼	43¾	44½
15	105¾	106¼	115	278¾	280	28⅝	29¼	44	44¾

The above table gives the closing quotations on the London Metal Exchange. All prices are in pounds sterling per ton of 2,240 lb.

Metal Markets

New York—Oct. 15, 1919

The markets for copper and lead were in great confusion this week. Producers and consumers were equally uncertain in determining the real positions. In some quarters copper was viewed as being stronger, while in other quarters it was held to be weaker. With respect to lead, however, there was no doubt as to the strength.

Transatlantic freight rates were about the same as in the previous week, but with a leaning toward easier tendency. The rates from San Francisco to Hongkong and Kobe remained unchanged at $18.

Copper

A larger business was done by producers this week than for a long time previously, and a good many producers figured in the market. The buying was mainly by wire-drawers, but some business in cakes was done. There was also some small export business, both through the Association and outside of it. Japan bought early for delivery and Germany bought several lots, and probably would buy more at 21¾.

The prices realized this week varied widely, some business being done as high as 23c, but a great deal larger business at lower figures. The old asking price of 23½c, delivered, has now been forgotten. Producers were trying to find a market, and each one being ignorant of the actions of others, and buyers being completely in the dark, all kinds of prices were asked and were realized. This condition prevailed right through the week and as late as this afternoon had not cleared up. Taking into account the volume of transactions at different prices, we average the market throughout the week at 21¾c.

Copper Sheets—33½c per lb. Demand is strong. Wire, 25@26c.

Tin

This market was erratic, under the influence of the longshoremen's strike. It rose sharply and then declined with the probability of termination of the strike. The amount of business transacted was light.

Lead

There was a very large inquiry for consumption, especially at interior points, which caused a sharp advance in the St. Louis market, which at present is the market most truly indicative. The satistical position is very strong, and lead is wanted in large quantities by corroders, the manufacturers of blue-lead products, and by the makers of storage batteries. There are only a few producers who have any lead to sell, and they apparently are not anxious to dispose of it. The A. S. & R. Co. maintains its price at 6¼c, New York, but yesterday and today it seemed to be impossible to buy any lead under 6½c. The quotation for lead in the New York market this week is more nominal than anything else, scarcely any business having been transacted here.

For bonded lead for export 5⅞c is asked.

The St. Joseph Lead Co. began producing lead at Herculaneum on Oct. 9. The labor troubles in the Coeur d'Alene are reported settled. At Alton, Ill., however, there is still trouble and that plant is producing at only partial capacity.

Zinc

In rising to the neighborhood of 7.50c, such free selling was encountered that the buyers withdrew, and consequently prices eased off a little, but toward the close sales were made again at 7.40c for October and 7.50c for November-December. There was only a little inquiry by domestic consumers. The outstanding feature of the week was widespread inquiry from foreign countries, which resulted in the

sale of several thousand tons to Great Britain. Large inquiry from Great Britain, Belgium and France is still pending. At present export business can be done only via Galveston, which confines it to smelters in Arkansas and Oklahoma, smelters east of the Mississippi being unable to pay the freight rates from New York or Baltimore and meet the European market.

The zinc smelting works at Donora and Terre Haute are idle owing to strikes.

Zinc Sheets—$10.50 per 100 lb.

Other Metals

Aluminum—33c per lb.

Antimony—Unchanged at 8½c for spot. Futures were quoted at 8½c. In some quarters 9c for futures was asked, but no business was reported done at that price.

Bismuth—Unchanged at $2.96.

Cadmium—Unchanged at $1.40.

Nickel—Ingot, 42c; shot, 43c; electrolytic, 45c.

Quicksilver—Following very heavy reduction in the price for quicksilver in the London market, our own market declined sharply. On Tuesday afternoon sales were made at $85. This morning the price dropped to $75. San Francisco telegraphs $80, soft.

Silver—Market showed some decline until Oct. 14. Orders from China in London found supplies very scant, and accounted for the advance on the 15th to 63¾d. Exports of bar silver to London and the Continent, week ending Oct. 11, 287,000 oz.

The general stock of money in the United States on Oct. 1, 1919, totaled $7,662,898,238; of this, $2,905,726,555 was in gold coin and bullion, $308,145,759 in standard silver dollars, and $243,380,383 in subsidiary silver. The money in circulation on Oct. 1 was $5,806,571,880, or $54.58 per-capita circulation.

Mexican dollars at New York: Oct. 9, 90¾; Oct. 10, 91; Oct. 11, 91¼; Oct. 13, holiday; Oct. 14, 91⅜; Oct. 15, 92⅛.

Platinum—Unchanged at $130@135 for refined ingot. The demand from jewelers is active.

Palladium—Unchanged at $120.

Zinc and Lead Ore Markets

Joplin, Mo., Oct. 11.—Zinc blende, per ton, high, $46.80; basis 60 per cent zinc, premium, $45; prime Western, $45; fines and slimes, $42.50@$40; calamine, basis 40 per cent zinc, $32@$30. Average selling prices: Blende, $43.93; calamine, $34.13; all zinc ores, $42.59.

Lead, high, $78.70; basis 80 per cent lead, $77.50@$75; average settling prices, all grades of lead, $76 per ton.

Shipments the week: Blende, 8,089; calamine, 107; lead, 1,480 tons. Value all ores the week, $471,410.

Sellers tried to set the price at $47.50 to $50 basis, but buyers "sit tight" on $45 basis, some sellers coming across late today with offers to accept $45. A report of $46 basis for some ore high in iron is circulated without verification. Buyers of premium ore were limited to a $45 basis, and their buying was light. In fact, at noon today all buying was light, but the offers of sellers to accept the basis may sell a large tonnage tonight.

Platteville, Wis., Oct. 11.—Blende, basis 60 per cent zinc, $46@$47 base, both for premium grade and prime Western grade. A temporary shortage of blende, particularly prime Western grade, caused sharper competition among buyers wanting the ore. Lead ore, basis 80 per cent lead, $72 per ton. Shipments reported for the week are 2,059 tons blende, 199 tons galena, and 349 tons sulphur ore. For the year to date the totals are 78,066 tons blende, 5,017 tons galena, and 13,232 tons sulphur ore. Shipped during the week to separating plants, 2,273 tons blende.

Other Ores

Tungsten Ore—But very little business was done, and there seem to be no very good prospects. Chinese ore was quoted at $7.25, with intimations that concessions might be obtained.

Molybdenum Ore—Quoted nominally at 75c.

Chrome Ore—Rhodesian ore, basis 45 per cent, was reported offered at $7 per long ton, c.i.f., Eastern ports.

Manganese Ore—Quoted nominally at 50c per unit.

Pyrites—Spanish pyrites is quoted at 17½c per unit for furnace size ore, free from fines, c.i.f. New York or other Atlantic ports.

Average Prices for September

Lead, New York	6.108c
Lead, St. Louis	5.853c
Lead, London	£25.330
Zinc, New York	7.510c
Zinc, St. Louis	7.160c
Zinc, London	£40.955
Silver, New York	114.540c
Silver, London	61.668d
Copper, electrolytic, N. Y.	21.755c
Copper, standard, London	£100.757
Tin, New York	54.482c
Tin, London	£280.102
Bessemer pig iron, Pittsburgh	$29.35
Basic pig iron, Pittsburgh	27.15
No. 2 foundry, Pittsburgh	28.15

Iron Trade Review

Pittsburgh—Oct. 14

The steel strike, now in its fourth week, is losing ground, but only slowly. Production, taking the industry as a whole, is still not up to 60 per cent of normal, although employment is perhaps at a trifle over that figure. Working forces are commonly inefficient, so many new men having been taken on, and at a number of works men are employed at odd jobs without there being regular production. Employment in Western Pennsylvania has continued to increase, whereby the Shenango Valley is operating almost full, and municipal Pittsburgh is operating nearly full, but mills in the lower Monongahela Valley are still somewhat shorthanded, and at Monessen, the head of the valley, the men have not stampeded to work, as was expected when the return began last week.

Both in Youngstown and Cleveland, however, which were closed tight, the beginnings of resumption have just occurred. One blast furnace is operating in Cleveland, and at Youngstown about four furnaces are operating, with a few openhearth steel furnaces and one bessemer converter. The Wheeling district remains tightly closed.

Steel consumers are not importuning mills for deliveries, but, instead, are expressing their sympathy and anxiety to co-operate. Jobbers are parceling out their stocks to regular customers.

Pig Iron—Several merchant furnaces closed by the strike have resumed, and production of merchant iron is not nearly as much under normal as is the case with steel. Bessemer and basic are fairly plentiful, though foundry iron is somewhat scarce. Prices are unchanged: Bessemer, $27.95; basic, $25.75; malleable, $26.25@$27.25; foundry, $26.75; forge, $25.75, f. o. b. Valley furnaces, $1.40 freight to Pittsburgh.

Steel—Billets and sheet bars have grown extremely scarce, as steel-producing mills are more affected by the strike than are finishing mills. Prices are largely nominal, and no attempts are made to secure premiums. Regular prices, now largely nominal, are: Billets, $38.50; sheet bars and small billets, $42; slabs, $41; rods, $52.

Ferromanganese—There is practically no inquiry. One or two of the English producers are quoting $95, c.i.f. Nominal quotation of domestic producers is $110, delivered.

Coke—Coke is weak, but not much is being dumped on the market. Consumption of merchant coke is somewhat heavier than it was a fortnight ago. Production in the Connellsville region is sharply curtailed in an effort to meet condition. Foundry coke consumption is as heavy as formerly, but offerings are larger. We quote furnace coke at $4 and foundry at $5.50@$6.25 per net ton at Connellsville ovens.